TECHNICAL REPORT - SDC 279-1-11

REPORT ON RESTORATION INVESTIGATIONS OF THE PERSONALITY CHARACTERISTICS OF SURGERY RIGHT ABOVE-THE-KNEE AMPUTEES

(Aeromedical Research)

Research Division, College of Engineering, New York University
Project SO

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Chapter I

1.0 FOREWORD

1.11 What the Report Covers

This report presents the results of a study of the psychological adjustment problems of a group of forty-eight above-the-knee leg amputees who reside in the Metropolitan New York Area, and gives special attention to their adjustment problems with prosthetic devices. All of the subjects are veterans of World War II, and each sustained the loss of his limb as a result of combat experience with one of the military services.

The research study is concerned particularly with an evaluation of the role of psychological factors -- attitudes and opinions, hopes and aspirations -- as they may affect adjustment to a prosthesis.

1.12 Related Reports

There are four related reports, all of which have been issued by the Research Division, College of Engineering, New York University, which may be profitably considered in conjunction with the present report. The three questionnaire survey studies are concerned with approaching the issues and problems of above-the-knee amputees from widely different points of view and purposes, and the fourth report consists of the experimental design of and procedures for the service testing of artificial limbs for above-the-knee amputees.

The "Report of Questionnaire Survey of 126 Above-The-Knee Amputees" examines matters relating to amputees' own evaluation of their prostheses as well as the problems, difficulties, and limita-

tions which arise in connection with the use of artificial limbs by leg amputees. This report highlights background information important to an understanding of the problems of the above-the-knee amputee with his prosthetic device from his own point of view.

The second study, "Report of Questionnaire Study of 68 Orthopaedic Surgeons (Specialists in Leg Amputations)," approaches the same problems and issues and considers them from the point of view of the orthopaedic surgeon. This study is also useful in orienting the reader to the present report.

The third survey, which evaluates the above-the-knee amputee through the eyes of the limb fitter and limb manufacturer, yields still another picture of the problems and issues incident to adjustment to a prosthesis. This study is entitled "Report of Questionnaire Study of 69 Limb Makers and Limb Fitters," and may be rewardingly consulted for background material.

The three studies, in approaching the amputee from the points of view of the major professionals who service him in connection with his amputation, training, limb fitting, and walking instruction, are all valuable in providing a frame of reference for the current study.

The fourth report, which relates to carefully developed procedures for the service testing of artificial limbs for above-the-knee amputees, represents a continuing effort by the project staff to gain more information about leg amputees and their problems of adjustment to prosthetic devices. Entitled "Experimental Design for the Service Testing of Prosthetic Devices for Above-the-Knee Amputees," the report

outlines an additional body of information which should prove useful in providing perspective for the current study.

1.13 Related Research

Related to the research reported upon in the present report are two doctoral dissertations which have been inspired by this project and which draw heavily upon many of the data collected in the larger study to which they are a welcome addition. One of these, "The Relationship Between Personality and Efficiency in the Use of Prostheses by Amputees," prepared by Sidney Levy, a member of the project staff, has been presented to the School of Education, New York University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy. A second, entitled "An Investigation of the Relationship of Expressions of Self-Concept of Above-the-Knee Amputees and their Adjustment to Leg Prostheses," has been developed by Sidney Fishman, also a staff member, for presentation to Teachers College, Columbia University, in partial fulfillment of his requirements for the Doctor of Philosophy degree.

In addition to these two contributions to the psychological literature, through the cooperation of the New York School of Social Work, Columbia University, Miss C. Etta Walsh has worked up a master's thesis, "Examination of a Psychological Study of the Influence of Personality Factors in Adaptability to Prostheses: A Critical Analysis of Seven Clinical Interviews." Miss Walsh's study should be a welcome addition to the literature on social work, and it is useful in critically examining the interviewing techniques employed in the research project covered by this report.

1.14 Bibliography of Related Studies

A bibliography of studies related to the present one is included as an appendix to this report; and it is felt that some of the entries, which have been starred, may be profitably consulted in connection with interpreting the data presented here.

1.15 Organization of this Report

Chapter I provides an introduction to the research, and sets the frame of reference for the study.

Chapter II offers a brief outline of the design of the study as a basis for Chapter III, in which the findings are summarized, and Chapter IV, in which the conclusions and recommendations are briefly set forth.

By reading merely these four chapters, one is able to get the central findings and conclusions of the research project.

Chapter V, which presents the research procedures in detail; Chapter VI, which outlines the methods of data treatment in full; Chapter VII, which offers complete tables of the data collected; and Chapter VIII, which discusses the implications of the data and findings in relation to other work which has been done in this area, have been prepared for readers who are interested in going into the material covered in this report.

1.2 INTRODUCTION

World War II greatly increased the number of persons who face the problem of adjustment to physical handicap. As one kind of physical handicap, amputation of legs has not only practical and social significance but also scientific interest. Perhaps one of the most crucial questions, and one which has been asked for many years, in the study of the physically handicapped has to do with the effect of injury and loss of the functional use of a portion of the body upon the personality and attitudes of the individual so affected. In a narrow sense, the present research addresses itself to a consideration of the issues involved in connection with adjustment to a total loss of function, and to the problems encountered when individuals are fitted with prosthetic devices which have as their purpose the restoration of at least part of the original function.

1.21 The Physically Handicapped

It is readily observable that since World War II the attention of the American public has been increasingly directed to the large number of citizens of the country who have permanent physical handicaps of one kind or another. Although numerous estimates of the size of the physically handicapped segment of our population have been made, there is consensus among workers in the area that perhaps as high as one-eighth to one-ninth of the population is physically handicapped to a greater or lesser degree.

The presence of so large a segment of the population poses certain unique problems of public health, physical and mental re-

habilitation, vocational education and employment, which are only now beginning to receive the attention which they have long deserved. On the whole, there is common agreement that present facilities for the care and treatment of the physically handicapped are largely inadequate, and that present trained personnel and job opportunities for the well trained in the physical rehabilitation field are at a minimum compared to the needs. Fortunately, there are signs that steps are being vigorously taken in various sections of the country to bring about a favorable change in the situation which now exists.

1.22 The Orthopaedically Handicapped

A large and important group of the physically handicapped are those with permanent orthopaedic impairments. The orthopaedically handicapped segment includes not only those who have suffered from various bone injuries and diseases, but also the cerebral palsied, the poliomyelitics, the amputees, and other groups.

Taken together, these several kinds of orthopaedically handicapped constitute a distressingly large portion of the total group with physical handicaps. With unusual problems in training and educational and vocational placement, the orthopaedically handicapped represent a real challenge to physiotherapists, occupational therapists, and indeed to all others whose professional and social concern is with their welfare.

1.23 Leg and Arm Amputees

A considerable number of the orthopaedically handicapped are amputees. It has been reliably estimated that the total number of all kinds of amputations which are performed annually in the United States is in the neighborhood of 25,000. Such amputations are, of

course, due to a number of causes, chief among which are certain degenerative diseases, automobile accidents, and industrial accidents.

During World War II, owing principally to traumatic injuries, about 18,000 service men sustained either arm or leg amputations, and in some cases both kinds. When this group of service-connected amputations is added to the annual crop of about 25,000 civilian amputees, a sizeable segment of the total population of the country is involved. It has been estimated, for example, that there are in excess of 500,000 persons at the present time who are amputees. It is clear that a group of this size constitutes a major problem to those concerned with physical rehabilitation, vocational education and resducation, and job placement.

Since the end of the recent war, the Federal Government has made available annually large sums of money for the purpose of developing better prosthetic devices both for veterans and civilians. With funds jointly provided by the Veterans Administration, the Army, and the Navy, research has been going forward during the past three years principally under the direction of the Advisory Committee on Artificial Limbs of the National Research Council.

It should be pointed out again that the research reported on here is concerned solely with above-the-knee amputees, who present special problems with respect to the design, fitting, and maintenance of their prosthetic devices. Although the study is limited in this way, experience has suggested that many of the conclusions reported herein are likely to be applicable, with probably only minor modifications, to other classes of amputees.

1.24 Psychology of the Physically Handicapped

Practically all kinds of physical handicaps have in common the fact that certain kinds of activity and social behavior become either impossible or difficult for the individual who is handicapped. For the average amputee, the loss of a limb frequently serves as a never-ending source of limitation and frustration in that it imposes certain kinds of physical and social limitations upon him.

There are certain typical modes of adjustment which are available to the handicapped individual which may be identified as follows:

(a) Withdrawal - This is characterized by a withdrawal into the self, and a tendency to avoid situations which might cause embarrassment and discomfort.

(b) Substitutive - In this type of adjustment, unattainable modes of self-expression are replaced by methods of response which are different in kind, but which serve to realize a similar goal.

(c) Obliterative - This is a type of adjustment in which the individual seeks to repress any conscious recognition of his disability. Frequently, even in cases of great functional deficit, physically handicapped individuals may refuse to admit that they are incapacitated in any way.

(d) Compensatory - This is a complex and diversified grouping of reactions of the following types:

(1) fatalistic attitudes toward physical condition and the future;

(2) paranoid reactions with projection or displacement of feelings of inadequacy upon other persons or conditions,

(3) cyclic changes in mood, from depression to elation, and

(4) extremely aggressive and competitive reactions.

Research in this area has suggested that maladjustment among the orthopaedically handicapped may take one or several of the following forms:

(a) Withdrawing, retiring, reticent behavior

(b) Shy, timid, self-conscious, fearful behavior

(c) Serious, thoughtful behavior

(d) Refusal to recognize real condition, concealment, delusions

(e) Feelings of inferiority

(f) Emotional and psychosexual immaturity

(g) Friendless, isolated, asocial behavior

(h) Paranoid reactions, sensitivity, suspiciousness

(i) Craving for affection; love of praise, seeking of attention

(j) Extremely high goals

(k) Extremely aggressive, competitive behavior

(l) Anxiety, tension, nervousness, temper tantrums.

Extremely important in establishing the behavior patterns of adjustment or maladjustment which may develop are the conditions under which the disability was acquired, and the attitudes which the individual has developed for purposes of interpreting his traumatic experience to himself and others.

It is probable that different modes of adjustment are utilised as the interval of time between the injury and the point at which we observe the disabled is increased. Very little research attention has been devoted to an understanding of the long term effects of or-

traumatic injury upon the personality of the individual, but what evidence there is suggests that long-continued effects are not only possible, but even frequent.

As a general principle, it appears that the physically handicapped tend to make a better type of adjustment to a total loss of function than they do to a partial loss of function. The restoration of partial function to an amputee by means of a prosthetic device is frequently accompanied by rather marked changes in attitudes which cannot always be predicted.

Finally, of great importance are the expressed and implied attitudes of other persons toward the physically handicapped. By way of summary, the experimental data suggest the following trends in attitudes:

(a) Public verbalized attitudes toward disabled persons tend to be mildly favorable

(b) The deeper, unverbalized attitudes may be more hostile.

The effect of expressed or implied attitudes of others upon the physically handicapped is frequently of great significance in determining the attitudes of the disabled toward their own disabilities.

1.25 Original Conception of the Present Research

Under the original contract, the Research Division, College of Engineering, New York University, was called upon to design a biomechanical knee for inclusion in a leg prosthesis. Considerable observation of above-the-knee amputees had suggested that much of their difficulty in walking adequately on a prosthesis was apparently due to their inability to experience and control "normal" knee flexion and movement.

As the development and design of the biomechanical knee device progressed, it became increasingly more clear to the engineering staff that relatively little was known about the pattern of normal gait, and the ways in which gait with a prosthesis departed from it. Accordingly, force plate equipment, which is described in the engineering report on this project, was developed; and basic studies in normal and amputee gait were undertaken.

Gradually, as the scope of the project broadened, and the engineers became sensitized to new methods of studying their problem, the importance of studying the individual who wears the prosthetic device forced itself upon their attention. What they had originally considered as a complicated engineering problem emerged as an even more complicated study in human engineering. As conceived by the project staff, human engineering in the present context is concerned with a study of the relations between men and the devices and equipment with which they walk and interact.

The study of the development and design of a biomechanical knee became refocused as an inquiry into the man-machine relations which exist when an amputee is fitted with a prosthetic device. At this stage of the project, a group of psychologists were called in to study the man member of the man-machine interaction system. Conceived in these broad terms and dedicated to the principle that the human individual, in all his complexity, is even more important than the mechanical efficiency of the prosthetic device, the present basic inquiry into the psychology of the amputee has been undertaken.

The inquiry has been focused on the amputee and his attempts to reach an adjustment to his prosthesis, and has employed a series of research procedures fashioned by clinical psychology to tease out some of the answers to an imposing assortment of fascinating questions and problems.

Chapter II

2.0 OUTLINE OF THE RESEARCH PROJECT

2.10 Background

It has been common observation for many years that some amputees learn to use their prostheses well, and that others experience a great deal of difficulty in acquiring the skills necessary to walk efficiently with prosthetic devices. In recent years, orthopaedic surgeons, limbfitters, physiotherapists, and others who have been intimately concerned with artificial limbs have expressed the opinion that perhaps psychological factors are responsible for the marked variations in the performance of amputees with artificial limbs.

There is an increasing conviction on the part of some that psychological factors may play an even more significant role in adjustment to a prosthetic device than the design characteristics and mechanical efficiency of the artificial limb itself. This research is concerned, in the largest sense, with an appraisal of the role of the psychological factors in the adjustment of above-the-knee amputees to conventional prosthetic devices.

2.20 Specific Problems of the Research Project

The specific problems to which the research project addresses itself may be stated as follows:

(1) What personality characteristics make for adequate and inadequate adjustment by above-the-knee amputees to a prosthetic device?

(2) What is the specific role of the attitudes of above-the-knee amputees which are related to adequate or inadequate adjustment in their use of a prosthesis?

Several related problems, which are investigated in the continuing work of the project staff, are not specifically investigated in this study:

(1) What are the types of training programs likely to be most useful and helpful for above-the-knee amputees in their learning to make the most effective use of a prosthetic device?

(2) What specific types of psychotherapy and counseling, if any, are likely to be most helpful in working with inadequately adjusted above-the-knee amputees?

2.30 A Study in Prediction

In the broadest sense, the research has been designed as a study in prediction. The aim of any prediction study is to establish an estimate, in advance of participation by the subject in a given task, of the level of his performance. In order to achieve this end, prediction research attempts to assess variations in personality traits, skills, and capacities, and relate them to differences in the levels of performance of individuals, and to situational factors in the environment which are presumed to influence performance.

If we are confronted with the fact of individual differences in the performance of above-the-knee amputees with their prosthetic devices, our problem becomes that of determining what factors which are useful in making predictions are associated with the variations. In principle, there are only two kinds of factors--personal and situational. The personal factors are those of a psychological, physiological, and neurological nature which may affect performance.

Situational factors are those aspects of the environment which are relatively independent of the subject but to which he responds. Both kinds of factors constantly interact and thus influence the individual's performance with his artificial limb. Situational factors must be described in terms of the manner in which they are understood by the subject himself if their relevance in a prediction study is to be appreciated.

It is important to keep in mind that two persons may manifest approximately the same characteristics, at least in terms of measurable personality traits, and yet be quite different in their performance in walking with artificial limbs. In such a situation, it is conceivable that one of the two may have reached the limit of his development with respect to skills at the time of assessment, and the other may still be in the process of making progress with respect to adjustment to his prosthesis.

In addition, extrapersonal factors may account for some of the variation in performance of an amputee with an artificial limb. There are obvious factors of a situational sort which may be readily observed as well as more subtle ones which are involved as the individual interacts with non-amputees and has to come to terms with the attitudes which the latter express.

2.40 The Predictor Instruments

In the project reported here, the following predictor instruments have been employed. A brief description of each follows, and the reader is referred to the Appendix A for samples of the separate instruments.

(1) Biographical Information Blank

This is a specially prepared personal history form which collects data on education, employment, social adjustment, family, and medical background. (See Appendix A-1.)

(2) Amputation Questionnaire

This is a specially prepared questionnaire which has been designed to collect a wealth of information about the attitudes of the amputee toward prosthetic devices, surgeons, limb fitters, his training in the use of his artificial limb, and his military history. (See Appendix A-2.)

(3) Wechsler-Bellevue Test of Adult Intelligence

The purpose of this test is to provide information on the subject's verbal and performance intelligence. (See Appendix A-3.)

(4) Bell Adjustment Inventory (Adult Form)

This inventory provides an outline of the individual's subjective evaluation of himself in six major areas of adjustment. (See Appendix A-4.)

(5) The P-S Experience Blank

This inventory provides the subject with an opportunity to reveal his physiological and psychological adjustment capacities. (See Appendix A-5.)

(6) Rorschach Psychodiagnostic Test

This projective personality test provides a "structural" picture of personality dynamics. (See Appendix A-6.)

(7) Open-End Attitude Scale

This specially constructed sentence completion test taps

attitudes in a wide variety of fields, especially those related to the individual's disability and his general adjustment. (See Appendix A-7.)

(8) Modified Thematic Apperception Test

The purpose of the modified Thematic Apperception Test is to tap the needs, strivings, identifications, and projections of the subject. (See Appendix A-8.)

(9) Guided Clinical Interview

The purpose of the interview is to round out information about the individual and to tap material concerning the emotional and temperamental components of his personality as they become evident in relation to the significant persons in his life, and in important early and more recent interpersonal situations. (See Appendix B-1.)

(10) Neurological Examination and Sensory Exploration

The purpose of the neurological examination is to assess the subject's nervous system. The sensory exploration studies are undertaken to note any sensory changes which may have occurred as a result of amputation and subsequent trauma. (See Appendix C-1.)

(11) Draw Two Men and a Woman and Tell a Story Test

The function of this test is to collect information about the individual's conception of himself as a physically extended body, and to note any deviations in body image which may be related to bodily injury. (See Appendix A-9.)

2.50 The Criteria

The goal of the present prediction research is the discovery of factors associated with individual differences in performance with prosthetic devices. It is obvious, therefore, that we must be able to establish a method for measuring such individual differences in performance. Since walking with an artificial limb is a highly complex process about which only relatively little is known, it is necessary for us to devise a number of reasonably objective and stable indices which, while they will not measure all of the factors, will evaluate some of the major aspects of the process of gait.

For the purposes of this research, the following measures of performance and adjustment were utilized:

(1) Moving pictures of the gait of amputees. Each picture sequence was evaluated by a panel of three "experts" on gait. (See Appendix D-3.)

(2) Achievement Test. To evaluate skills of the amputee in performing various tasks with his artificial limb. (See Appendix D-2.)

(3) Vocational Rating Blank. To assess the adjustment of the amputee to his work, as seen by his employer. (See Appendix D-1.)

(4) Certain Amputation Questionnaire items suggestive of personal and social adjustment. (See Appendix D-5.)

An attempt has been made to keep each criterion as objective and stable as possible, but it is obvious with criteria of the kind employed in the research that this ideal has not been fully achieved. Rather, we have ended up with a number of criteria which are presumably more independent than interdependent, and which, on the whole,

are hardly of the type to be desired. Yet they are the best criteria which could have been employed in the present study.

2.60 Characteristics of the Subjects

Forty-eight male above-the-knee amputees, all veterans of World War II, make up the group of subjects used in the study.

The subjects were chosen in such a manner as to be representative of the larger group of above-the-knee amputee veterans in the Metropolitan New York area, in which all of the subjects reside. They are predominantly in their late twenties, of average formal educational achievement, and virtually all of them sustained their injuries as a result of combat experience. Most of the men had been in the U.S. Army, and over one-half of them at the time of investigation were married.

More detailed characteristics of the sample population, and comparisons of it with another randomly chosen sample, may be found in Tables 7.20-1, 7.20-2, 7.20-3, and 7.20-4 in Chapter VII.

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Chapter III

3.0 RESEARCH FINDINGS

The following are the principal findings which emerge from this research.

3.10 The Nature of the Experimental Population

(1) A comparison of the forty-eight above-the-knee amputee veterans who constitute the subjects of this project with a randomly chosen group of forty-eight other above-the-knee amputee veterans reveals that the two groups are alike with respect to most of the variables, and were drawn from a common population. (See Table 7.20-2.)

(2) Careful neurological examinations reveal that virtually every subject is neurologically negative. There are no evidences of neurological pathology or disturbance among the forty experimental subjects examined. (See Table 7.20-4.)

3.20 Prediction Instrument Findings

(1) The Bell Adjustment Inventory and the Seitz-McFarland P-S Experience Blank are significantly correlated with each other -- r = .57 -- and may therefore be presumed to be assessing the same or similar components of personality. (See Table 7.50-1.)

(2) The Seitz-McFarland P-S Experience Blank and the Open-End Attitude Scale are significantly correlated with each other -- r = .54 -- and may therefore be presumed to be measuring the same or similar components of personality. (See Table 7.50-1.)

(3) The Wechsler-Bellevue Test of Adult Intelligence, Full Scale, is positively correlated -- r = .29 -- with the Seitz-McFarland P-S Experience Blank, and this correlation is significant at the 5 per cent level. (See Table 7.50-1.)

(4) The Bell Adjustment Inventory and the Open-End Attitude Scale are significantly correlated -- r = .63 -- and may therefore be presumed to be measuring the same or similar components of personality. (See Table 7.50-1.)

3.30 Criterion Instrument Findings

(1) There are no statistically reliable correlations among the four criterion instruments, and each instrument or technique may be presumed to be a relatively independent measure. (See Tables 7.50-1 and 7.50-2.)

3.40 Findings of Prediction Instruments in Relation to Criterion Instruments

(1) The Seitz-McFarland P-S Experience Blank correlates significantly -- r = .54 -- with the Achievement Test. (See Table 7.50-2.)

(2) The Amputation Questionnaire items are unrelated to any of the measures of personality. (See Tables 7.50-1 and 7.50-2.)

(3) Amputee gait on a prosthesis, as judged by a panel of experts, is unrelated to any of the prediction instruments -- See Tables 7.50-1 and 7.50-2 -- with the exception of the Rorschach Test. (See Table 7.61-8.)

(4) Positive attitudes toward sex, as assessed by the Guided Clinical Interview, occur more frequently among the amputees who walk "more efficiently" on prostheses than among those who perform less well on their artificial limbs. (See Table 7.50-3.)

3.50 Miscellaneous General Findings

(1) The Rorschach Test, as a "structural" measure of personality, is useful for discriminating between "efficient" and "inefficient" users of leg prostheses. (See Table 7.61-8.)

(2) In terms of its effect upon the neurological status of the individual, there appears to be no difference whether the left or right leg has been amputated. (See Table 7.20-4.)

(3) The incidence of phantom limb sensations among above-the-knee amputees is considerably greater than that suggested by the current literature. There were only three subjects among forty in whom the sensations do not occur. (See Table 7.20-4.)

(4) Minor causalgias (reverberating pains) are considerably more frequent among above-the-knee amputees than might have been expected upon the basis of informed professional opinion. (See Table 7.20-4.)

(5) There is only a low positive correlation -- r = .31 -- between the stump-height ratio and ability to walk efficiently with a prosthesis, as judged by a panel of experts. (See Table 7.20-3.)

(6) There is only a low negative correlation -- r = .36 -- between the number of months elapsing between amputation and fitting with a prosthetic device and efficiency in gait, as judged by a panel of experts. (See Table 7.20-3.)

3.60 Miscellaneous Special Findings

(1) According to a qualitative analysis of the significant Rorschach Test scoring factors, differences in the personalities of the "efficient" and "inefficient" walkers, as assessed by the Rorschach Test, revolve around four personality variables:

(a) Productivity -- as revealed by R, I/RT. The "efficient" group is more productive than the "inefficient" group.

(b) Energy -- as indicated by W, R, A%, F, and I/RT. The "efficient" group is characterized by more energy, drive, and ambition.

(c) Affectivity -- as suggested by FC, CF, and C. The "efficient" subjects are characterized by greater affective adaptability, and the exercise of more effective rational control in the face of emotional pressures arising from the environment.

(d) Awareness -- as revealed by Fc, FK, and Fk. The "efficient" walkers seem more consciously perceptive of inner disturbance, and this awareness probably serves as an impetus to improvement.

(2) The processing of the data by means of a modification of the Cronbach Technique revealed that approximately one-third of the predictions made about the amputees by the psychologists were correct. (A statement was accepted as correct if there were only five chances in one hundred that the result obtained could have been due to chance. A minimum of eleven judges concurring as to the identification of the statement was necessary to satisfy this criterion.)

(a) Thirty of the cases matched had fifteen statements each, whereas the remaining eighteen had only ten. In general more correct matchings were made for the 15 statement cases than for the shorter ones. The shorter cases were those of amputees for whom no Vocational Rating Report had been received because the amputee was self-employed or unemployed.

(b) In some cases identification was made easy by the wide area of the maladjustment of the amputee. This was true, however, in a few cases only.

(c) Matchings were more correctly made when cases were placed in a triad of dissimilar cases than when they were similar.

(d) Some of the personality data that enabled the psychologists to predict correctly were the following:

(1) Tendency for hostility to be worked out through the prosthesis.

(2) The individual did not project blame on others for his situation.

(3) Dependency.

(4) Need to prove self-adequacy.

(5) Feelings of inferiority about the self.

(6) Strong super-ego.

(7) Realistic acceptance of problems.

(8) Excellent social adjustment and ability to relate to people.

(9) Superior intelligence and motivation.

(10) Acceptance of responsibilities.

(11) Individual has a high sense of self-regard.

(12) Withdrawn, introverted person who receives security only from his family.

(13) Desires for independence which eliminate any personal type of complaints.

(14) Instance of secondary gain in a person whose amputation has been a blow to his security.

(15) Compensatory mechanisms employed for basic inferiority feelings.

(16) An individual who can project his feelings on things rather than people because this process permits aggressiveness to be expressed in a safe area.

It must be stressed that a knowledge of these factors in an amputee's personality does not always allow a psychologist to make a correct prediction about how a man will function on his job, adapt to his prosthesis, or walk. In some cases these factors are congruent with other personality factors which make prediction an easy task. In other cases, other factors are not known which can mask or limit the role which these personality factors play. In still other cases the psychologist has not been able to attain an adequate portrait of the individual either through resistance on his part or the lack of perceptiveness of the psychologist.

Chapter IV

4.0 CONCLUSIONS AND RECOMMENDATIONS

A number of supportable conclusions and recommendations arise from an analysis and consideration of the Findings reported in Chapter III, as follows.

4.10 Experimental Subjects

(1) The experimental subjects are fully representative of the larger population of amputee veterans from which they are drawn, but it is clear from our experience in this research that a considerably larger number of subjects must be investigated if presently available statistical methods are to be used in relating prediction and criterion data.

(2) The extensive neurological and sensory exploration study techniques for assessing the subjects appear valuable and useful, but attention should be directed to a considerable modification of them in the direction of making them more brief and less definitive.

4.20 Prediction Instruments and Techniques

(1) Since the Bell Adjustment Inventory and the Seitz-McFarland P-S Experience Blank correlate significantly with each other, either instrument may prove useful in the assessment of amputees, and our recommendation is that the P-S Experience Blank be employed as a non-projective personality inventory, in preference to the Bell Adjustment Inventory, in further research in this area.

(2) Since the Seitz-McFarland P-S Experience Blank and the Bell Adjustment Inventory both correlate significantly with the Open-End Attitude Scale, and the three instruments may be presumed to be as-

sessing similar components of personality, it is our recommendation that a new Open-End Attitude Scale or sentence completion test place greater emphasis on projective items and less emphasis on personal items if it is to be used in similar research. For discussion on this point, see Chapter VIII.

(3) Although intelligence as measured by the Wechsler-Bellevue Test of Adult Intelligence does not appear to be related to amputee performance with a prosthetic device, it is recommended that further attention be directed to the possible relationships which may actually exist between intelligence as measured by the Performance Scale of the Wechsler-Bellevue and effective use of a prosthesis by a leg amputee.

(4) The Rorschach Test appears to be a useful personality evaluation instrument in work with above-the-knee amputees, but we recommend its cautious application in this area until standards for the interpretation of Rorschach Test protocols for physically deviant persons have been developed. This research may be regarded as making a contribution in this direction.

(5) Although the Guided Clinical Interview used in this project presents unusual problems of interpretation and utilization, it represents probably the most useful assessment procedure which can be employed in future studies with leg amputees. For discussion on this point, see Chapter VIII.

(6) Although there appear to be no stable relationships between selected Biographical Information Blank items and the criteria, it is recommended that further research be directed to the issue of any relationships between life history data and effective performance with a leg prosthesis.

4.30 Criterion Instruments and Techniques

(1) The criteria used in this study are apparently all independent rather than interdependent, but each criterion has presented unusual problems in use and interpretation.

(a) Gait, recorded on motion pictures and evaluated by a panel of specialists, is exceptionally difficult to evaluate objectively and consistently. As a criterion, it appears too complex and subject to too many limitations for fruitful use as a measure of performance of amputees on a prosthetic device in a study of this kind.

(b) Achievement tests as used in this research appear to be promising as a measure of amputee performance with a prosthesis, and we recommend that further careful study be given their role as one of the criteria.

(c) The Vocational Rating Report employed in the research requires extensive reworking if it is likely to prove of use in a study of amputees as a criterion measure.

(d) The Amputation Questionnaire items have not proved rewarding as criterion measures, and we recommend that further research be directed to a consideration of items of this sort which may prove useful.

(2) We recommend that future research with amputees give basic consideration to the problem of developing comprehensive and stable indices of amputee gait performance, personal and social "adjustment", and data from prostheses and prostheses fitting.

4.40 Prediction Instruments in Relation to Criterion Instruments

(1) The Seitz-McFarland P-S Experience Blank, which is a non-projective personality inventory, in correlating significantly with the Achievement Test, a criterion measure, suggests that aspects of personality which are assessed by this blank enter into the quality of an amputee's performance.

Apparently, personality traits and characteristics which an amputee can verbalize, and which the P-S Experience Blank can, therefore, assess are related to performance with a prosthetic device by our subjects. This is an important finding, and we recommend that further research effort be directed to a consideration of its meaning.

(2) Positive attitudes toward sex, as revealed by the Guided Clinical Interview, are apparently related to the quality of the amputee's gait.

In view of the fact that some investigators are of the belief that leg amputation, especially above-the-knee, may activate "castration anxiety", this finding is particularly interesting, and should have the benefit of further careful investigation. Evidently there is some relationship, in principle, between the amount of castration threat and performance in walking with an artificial limb; but this requires careful study.

4.50 Miscellaneous General Conclusions

(1) It is significant that the Rorschach Test, which is our most searching projective technique for evaluating personality, should be useful in discriminating between the criterion groups of "good" and "poor" walkers.

We may expect that when we have had further experience with the Rorschach Test in its application to physically handicapped persons, we will find more effective ways of analyzing the test protocols.

(2) The low positive correlation between the stump-height ratio, and ability to walk efficiently with a prosthetic device is a finding which several informed workers in this field have predicted, but our data suggest that, while the length of the stump in relation to the height of a leg amputee is apparently one factor to be taken into consideration, insofar as our study is concerned, we have not found any statistically significant relationship.

In view of this fact, we recommend that further inquiries address themselves to a consideration of this matter in a more thorough and comprehensive manner.

(3) Apparently there is a relationship, although not statistically significant, between the amount of time, within limits, which elapses between amputation and fitting the patient with a prosthesis, and his subsequent walking performance on the artificial limb. Indeed, our data are suggestive of the principle that it is apparently desirable to fit an above-the-knee amputee with an artificial limb as soon as he can physically accommodate it.

In general, this finding is congruent with the conclusions of Wittkower (94) and others; but we urge its further careful investigation, preferably within the atmosphere of the hospital or amputation center.

(4) Our findings with respect to the incidence of phantom limb sensations among above-the-knee amputees are in line with those of Randall, Ewalt, and Blair (76), who also ascertained their occurrence in virtually all leg amputees whom they investigated thoroughly.

(5) Minor causalgias are also quite frequent in our forty subjects who were studied neurologically, and it is evident that this is a matter for further careful investigation by the neurologist.

4.60 Miscellaneous Special Conclusions

(1) The Rorschach Test, which assesses the dynamic components of personality, interestingly enough, suggests that the group of twelve "efficient" users of their prostheses are intellectually more productive, with greater energy and affective adaptability, and more insightful into their own needs and values than the group of twelve "inefficient" users of artificial limbs, as judged by the panel of experts.

These aspects of personality, which may be regarded as "positive", evidently distinguish the two criterion groups; and if our findings can be sustained in further investigations, they should make a contribution toward the better understanding of problems of adjustment to the loss of a lower limb.

(2) The Cronbach Technique, as modified in this experiment, revealed that psychologists, using data from the Open-End Attitude Scale, the Biographical Information Blank, and the Guided Clinical Interview, were successful in approximately one-third of their predictions. No specific factors were discovered which differentiated poor users from good users of artificial limbs, or men who adjusted well to their prostheses from men who did not make an adequate adjustment to their prostheses. A number of personality factors appear to play a role in the kind of adjustment an amputee will make to his prosthesis. To determine these, it is necessary to know the entire personality configuration of the individual. Particularly, in attempting to predict relatively structured criteria information, one encounters difficulty. Greater success is obtained as the nature of the predictions

is generalized. For example, one may be able to say that a man is liable to encounter difficulty in using his prosthesis well because it serves to emphasize the basic inferiority feelings present in the personality constellation, but not be able to predict whether or not he experiences difficulty with the pelvic band or friction-knee. Another difficulty preventing accurate prediction is the nature of the criterion information which, in one area at least, is highly unreliable owing to the possibility of halo effects influencing the judgment of the man's vocational performance by the employer.

It must be mentioned that many personality data exist which would enable psychologists to predict accurately certain facts about the amputee's adjustment to his prosthesis, for which we do not have criteria (e.g. marital difficulties, social relationships, actual handicaps in daily life functions, etc.) The technique, itself, we feel, has much to offer in that it yields material that can give not only quantitative relationships between predictor and criteria data, but qualitative ones as well.

Chapter V

5.0 RESEARCH PROCEDURES FOR DATA COLLECTION

5.10 Introduction

The research project was started on January 15, 1947, and the first step taken was an extensive thirty day critical survey of the literature. From this study of the literature, the following conclusions emerged:

(1) Personality tests of the inventory type have not differentiated between physically disabled and physically normal persons.

(2) Studies by means of interviews, observations, and reports of informants indicate rather consistently that physically disabled persons are more frequently "maladjusted" than physically normal individuals, although this is far from universal.

(3) Maladjustment appears in many forms, of which the following are representative from observational and clinical data:

(a) Withdrawing, retiring, reticent behavior

(b) Shy, timid, self-conscious, fearful behavior

(c) Refusal to recognize real condition; concealment, delusions

(d) Feelings of inferiority

(e) Serious thoughtful behavior

(f) Emotional and psychosexual immaturity

(g) Friendless, isolated, asocial behavior

(h) Paranoid reactions, sensitivity, suspiciousness

(i) Craving for affection; love of praise, seeking of attention

(j) Goals which are too high

(k) Extremely aggressive, competitive behavior

(l) Anxiety, tension, nervousness, temper tantrums

(4) Several correlates of maladjustment in physically handicapped individuals are fairly well established, although none of the correlations are high:

(a) Duration of disability

(b) Severity of disability

(c) Changing degree of disability

(d) Overprotection or rejection in the home

(e) Low intelligence

(5) The nature of the disability is relatively unimportant, within wide limits, as far as behavioral results are concerned.

(6) The situation in which the disability was acquired -- on the battlefield or in non-combatant action -- affects the behavioral resultants in the immediately following temporal interval.

(7) Reactions to permanently disabling injuries change with the lapse of time.

These conclusions, and others, were borne in mind when attention was directed in the early stages to the development of an experimental design. The original experimental design was discussed with a number of prominent research workers in the field of clinical psychology, and certain modifications and additions were made in line with their recommendations.

The experimental plan called for the completion of a Pilot Study on fifteen cases, the results of which would be evaluated

carefully before embarking upon the complete study. The Pilot Study on fifteen subjects was completed by June 15, 1947, and the results suggested that the basic plan did not require any serious modifications, and that we were justified in carrying through with the research as originally outlined. The results of the Pilot Study are reported in "Preliminary Investigations in Psychological Research on Above-the-Knee Amputees," issued July 1, 1947, and widely circulated among research workers interested in the project. As a follow up, a conference of six leading research psychologists who had become acquainted with the project was held on the occasion of the Detroit Meeting of the American Psychological Association in September 1947. From this conference, a number of helpful suggestions resulted, especially with respect to the treatment of the data. There was consensus among those participating in the conference that the basic experimental approach was sound.

5.20 Testing Instruments and Investigation Techniques

5.21 Basis for Choice

Since the literature had rather convincingly demonstrated the inadequacy of present-day tests of the personality inventory variety, a decision was reached to employ a number of projective tests and procedures because it was felt that these should prove to be a good deal more promising than the non-projective personality instruments. Moreover, we early made a choice of rejecting the spurious distinction between qualitative and quantitative data, even though it was fully appreciated that such a decision would result in data which could not be rigorously and statistically handled in accordance with

the usual techniques. Because of our insistence on collecting qualitative data wherever they were relevant and potentially significant, the study may appear to be lacking in elegance and precision, but we believe that it is thereby richer for its concern with psychological data which cannot be fully quantified but which are of the sort which a fully clinical psychological study necessarily yields.

Through the employment of a battery of instruments, we hoped to approach the problem of personality study and evaluation from a number of related but different directions. We also had in mind the idea that such instruments, which had never been employed previously in such investigations according to the literature and for which no norms or standards of interpretation had been developed, could be better interpreted and understood if each instrument were treated relative to each of the other instruments. We felt very strongly that a pattern of interpretation, and greater understanding of the individual subject, would result if each test were treated in relation to the other instruments, rather than entirely on its own.

In designing the experiment, we felt justified in placing most confidence in the Rorschach Test and in the Guided Clinical Interview as techniques for furnishing us with data likely to prove most useful; and we felt that the Thematic Apperception Test and the Open-End Attitude Scale would also provide rewarding information.

5.22 Testing Instruments and Techniques

Each of the following testing instruments and investigation techniques was administered to the experimental subjects, and the rationale for the inclusion of each and of its possible contributions is briefly outlined:

(a) The Biographical Information Blank (See Appendix A-1) --

This personal history form was specially constructed to collect all of the relevant factual data about the subject with respect to his education, family background, social and medical histories, etc.

(b) The Amputation Questionnaire (See Appendix A-2) --

This specially prepared questionnaire was designed to collect both factual information, and the opinions of the amputee with respect to prosthetic devices, to surgeons, to limb fitters, training experiences in walking with the prosthesis, and aspects of his military experiences.

(c) Wechsler-Bellevue Test of Adult Intelligence (See Appendix A-3) --

The intelligence test provides intelligence quotients on two scales, the verbal and performance, as well as a combined score for both scales.

(d) Bell Adjustment Inventory, Adult Form (See Appendix A-4) --

This personality inventory permits the amputee to make a subjective evaluation of himself in six major areas of adjustment.

(e) The P-S Experience Blank (See Appendix A-5) --

The Seitz-Wortland Psychosomatic (P-S) Experience Blank provides the amputee with an opportunity of revealing his physiological adjustment capacities.

(f) Rorschach Psychodiagnostic Test (See Appendix A-6) --

The Rorschach Test permits us to arrive at a "structural" picture of the personality of the amputee.

(g) Open-End Attitude Scale (See Appendix A-7) --

This is a specially constructed sentence completion test which permits the amputee to project his personality through his responses to the incomplete items. It provides information particularly with respect to the subject's attitudes toward his disability and his general adjustment.

(h) Modified Thematic Apperception Test (See Appendix A-8) --

The purpose of this projective instrument is to tap the needs, strivings, and identifications of the amputee, especially in relation to significant figures in his life and in connection with his loss of a limb.

(i) Guided Clinical Interview (See Appendix B-1) --

The purpose of the interview is to collect information which is not made available through any of the other instruments, and to tap data concerning the emotional and temperamental components of the amputee's personality as they have become evident in the subject's relations with significant persons in his life. Stress is placed on early family relationships as well as upon the circumstances surrounding the individual's loss of a limb.

(j) Neurological Examination and Sensory Exploration Studies (See Appendix C-1) --

The purpose of the neurological examination is to provide information as to the condition and status of the amputee's nervous system, especially in relation to his injury. The sensory exploration studies are to provide evidence of any sensory changes which may have occurred in consequence of the amputation and subsequent trauma.

(k) Draw Two Men and a Woman and Tell a Story Test (See Appendix A-9) --

The purpose of this test is to collect information about the individual's conception of himself as a physically extended body in space, and to discover any deviations in or modifications of body image which may be related to the injury which was sustained.

5.23 Method and Order of Test Administration

5.231 Method of Administration --

Each of the standardized psychological tests was administered in accordance with specific instructions provided in pertinent manuals. No time limits were imposed for the administration of the Amputation Questionnaire, The Bell Adjustment Inventory, The P-S Experience Blank, the Open-End Attitude Scale, and the Modified Thematic Apperception Test. In the cases in which time limits were imposed by the manual of instructions for a particular test, such time limits were rigidly adhered to.

Insofar as possible, a serious attempt was made by each of the psychologists charged with test administration to create a friendly, relaxed atmosphere in which the amputee might feel most comfortable and willing to cooperate to the maximum. In such instances in which a given subject asked questions about the purpose of a particular testing instrument, or raised doubts as to why he should participate in a particular task, he was given a direct, frank answer which usually proved entirely satisfactory, and permitted him to continue in the testing procedure. No attempt was made, at any stage, to hide the purpose of the inquiry, although

this purpose was usually stated in simple, down-to-earth terms which were intelligible and usually acceptable to the subject.

Each amputee was encouraged to proceed at his own speed, and practically each was tested alone and in the absence of other amputees, except in such situations in which this was necessarily precluded by physical circumstances. Each subject was encouraged and motivated to "do his best".

5.232 Order of Test Administration --

Where possible, the battery of tests was administered in three sessions of approximately three hours' duration each. In certain instances in which it was impossible for the subject to keep three separate appointments, the testing was done in two separate sessions on different days.

The order of test administration for the average subject was as follows:

Session 1

(1) Biographical Information Blank

(2) Wechsler-Bellevue Intelligence Test

(3) Bell Adjustment Inventory

(4) Amputation Questionnaire and Interview

Session 2

(1) Rorschach Psychodiagnostic Test

(2) Open-End Attitude Scale

(3) Modified Thematic Apperception Test

Session 3

(1) The P-S Experience Blank

(2) Draw Two Men and a Woman and Tell a Story Test

(3) Guided Clinical Interview

The neurological examinations and sensory exploration studies were conducted in two separate sessions, under the direct supervision of Dr. H.L. Teuber, in the Department of Neurology, College of Medicine, New York University, and using facilities provided by Bellevue Hospital. Such investigations consumed approximately four additional hours of the subjects' time, and were conducted several months subsequent to the administration of the psychological test battery.

5.24 Methods of Recording Data

The following instruments were accomplished by the subject in his own handwriting:

(1) Biographical Information Blank

(2) Bell Adjustment Inventory

(3) Amputation Questionnaire

(4) Open-End Attitude Scale

(5) Draw Two Men and a Woman and Tell a Story Test

The Wechsler-Bellevue Intelligence Test results were recorded by the test administrator in his own handwriting, and the same procedure was followed for the Rorschach Test. In addition, the psychologist working with the subject recorded additional material directly on the Amputation Questionnaire which became available as a result of the Factual Interview based on this questionnaire.

The following procedures were recorded on a special tape recorder provided by the Special Devices Center, Office of Naval Research, for this purpose and with the full knowledge and permission of the subject:

(1) Modified Thematic Apperception Test

(2) Guided Clinical Interview

The medical history data, and the data resulting from the neurological examination and sensory exploration studies, were directly recorded by the examiner in the presence of the amputee.

5.30 The Development of the Criteria

5.31 Introduction

The development of adequate and stable criteria to which the psychological findings can be related has presented unusual difficulties. Performance by an amputee with an artificial limb is an exceptionally complex process which is difficult to reduce to measurable aspects about which stable judgments can be made. From the very beginning, no attempt was made to measure all of the factors which enter into performance with a prosthetic device by an above-the-knee amputee. We have had to content ourselves, rather, with much more limited, and therefore more reasonable, aspects of the total process.

Considerable experience of others in the field of prosthetic research had suggested that it should prove helpful to ascertain to what extent a given amputee in his use of an artificial leg approaches to or departs from the patterns of gait of non-amputees. In the design of the experiment, therefore, one of our criteria became that of the approximation of the gait of the amputee to that of the non-

amputee. Another reasonable approach to the evaluation of amputee performance with his prosthetic device appeared to be his observable skills in performing the tasks imposed upon him by some sort of achievement test, and this became a second criterion by means of which we felt that some indication of differential performance could be made available.

For many years, those who have been concerned with the measurement of "adjustment" of a personal or social sort have been handicapped by reason of the fact that criteria upon which professional consensus could be reached have simply not been available. We have, of course, been faced with the same problem in connection with our evaluation of the amputee's "adjustment", and while we have by no means solved this issue, we have taken steps which, for our purposes, appear to be adequate to our needs.

We had hoped that we might utilize another, and presumably quite objective, criterion in our study. Such a criterion is a series of force plate readings made available to us by the members of our engineering staff. A limited number of amputees in our experimental group participated in the force plate studies, but as the work proceeded, it became clearly evident that the task of "reducing" the force plate data to some form in which we could use them was entirely too formidible and time-consuming a procedure. For this reason, among others, we have had to eliminate the force plate data as one of our criteria to which we might relate personality findings about our subjects.

The following criteria have been used in this research:

5.32 Ratings of Amputee Gait

In order to obtain data relating to the performance of our subjects in walking with their prosthetic devices, the following procedures were employed:

5.321 Moving Pictures --

Each amputee was photographed under the following standardized conditions:

(1) Moving pictures were taken of a head-on view of each amputee walking directly toward the camera, and then away from the camera, for a distance of fifteen feet. Two runs of each performance were made. Both were taken with a moving picture camera, placed at a considerable distance, at a speed of twenty-four frames per second. This procedure resulted in each amputee being photographed twice while walking directly toward the camera, and twice while walking directly away from the camera.

(2) A lateral view of each amputee was photographed while he walked from a point at the right of the moving picture camera to a point at the left of the camera. The distance between the two points was approximately twenty-two feet. Upon completion of this walking, the amputee did a right-about face and returned to his original point of departure. Two separate runs were made, each at the rate of twenty-four frames per second. This procedure resulted in lateral views of the amputee both on the side of his intact leg as well as on the side of his artificial limb.

(3) Each amputee was photographed while he ascended and descended a fifteen foot ramp which was level with the floor at one

end, and raised to a height of approximately two feet at the other end. Two runs of this performance were made at a camera speed of twenty-four frames per second.

5.322 The Rating Board --

A Rating Board to evaluate the moving pictures was formed, and consisted of Dr. Herbert Elftman, Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University, as chairman; Dr. Gabriel J. Rosenkranz, Orthopaedic Consultant, Prosthetic Testing and Development Laboratory, Veterans Administration Central Office; and Miss Signe Brumnstrom, a member of the project staff who as a physiotherapist specializes in the training of leg amputees.

5.323 Bases of Gait Ratings --

The following bases for evaluating amputee gait were agreed upon by members of the Rating Board, and the Check Sheet for the Rating of Prosthetic Efficiency may be found in Appendix D-3.

(1) Sideway of hips
(2) Lateral bending of trunk
(3) Lateral dipping of the pelvis
(4) Excessive raising of normal heel
(5) Pelvic rotation about vertical axis
(6) Arm swing
(7) Arm swing (on side of prosthesis)
(8) Length of step with prosthetic device
(9) Timing of heel contact
(10) Lumbar curvature

In utilizing these criteria, members of the Rating Board agreed among themselves to employ the following considerations:

(1) Certain inefficiencies have been found to be inevitable as a result of the fact that the artificial limb is not fully an integral part of the body. These characteristics of performance of amputees with a prosthetic device are typical of the amputee population at large, and must be taken into account in evaluating gait.

(2) Certain gait characteristics which are clearly the result of the body build of the subject under consideration must be excluded.

(3) All gait characteristics and limitations of use of the prosthesis which are clearly not the results of the aforementioned conditions will be evaluated by the Rating Board.

(4) Such characteristics are likely to fall into two separate groups:

(a) Aesthetic, which include movements and habits of the subject which do not necessarily reduce the utility of the artificial limb, but which invite the attention of the observer to the fact that the amputee is an amputee. These include exaggerated compensatory movements made by the subject.

(b) Utilitarian, which include the limitations of the artificial limb which reduce the number or quality of the subject's basic locomotor activities, such as his inability to walk up and down stairs, etc.

5.324 Procedure for Making Ratings —

Each member of the Rating Board independently viewed the motion pictures, and had the privilege of spending an unlimited amount of time with the pictures of each subject. Each judge could request a re-showing of any portion of the film, or the film in its entirety, as many times as he desired. Members of the Rating Board had agreed in advance that the specific items on the Check Sheet were guides, but not limiting factors in arriving at the final rating assigned to each amputee. In each instance, the rating represented the total impression made by the gait of the subject on the rater, and included, in addition to the ten factors provided on the Check Sheet, a number of less readily identifiable aspects of locomotion which were implicit rather than explicit.

The gait of each amputee was rated in accordance with "Instructions for Completing Check SheetA" (See Appendix D-3). As defined by the Instruction Sheet, poor is "a very marked deviation from the normal pattern;" fair, "a definite deviation from normal which is less conspicuous than poor;" and good, "a minimum amount of deviation from normal."

5.33 Achievement Test Ratings

In order to obtain data as to the skills of our subjects in performing a number of tasks associated with walking, the following procedures were employed:

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5.33 Achievement Test Ratings

In order to obtain data as to the skills of our subjects in performing a number of tasks associated with walking, the following procedures were employed:

5.34 Vocational Rating Reports.

In order to obtain data as to the work habits of and adjustment of the amputees to their jobs, the following procedure was utilized:

5.341 The Vocational Rating Blank --

A Vocational Rating Report, which may be found in Appendix D-1, was developed. This blank permits the rating of each amputee on a scale of 0 to 100 on the following characteristics with respect to his performance on the job:

(1) Emotional stability

(2) Self-confidence

(3) Friendliness

(4) Personal fitness for the position he occupies

(5) Quality of work

(6) Quantity of work

(7) Comparison with other men of the same length of service

(8) Evidence of growth

(9) Possibility for future growth

In addition, answers to the following questions were requested:

(1) How does he get along with other employees?

(2) How often is he absent from work?

(3) Does he use his amputation as an excuse to avoid work?

(4) What do you regard as his prospects for advancement?

5.342 Use of the Rating Report --

A copy of the Vocational Rating Report, together with a covering letter reproduced in Appendix D-1, were sent to the employer of each amputee who was working at the time of the study. Vocational ratings were obtained for all subjects except those who were going to school, were out of work, or were self-employed.

5.35 Amputation Questionnaire Items

In order to obtain data as to opinions of and attitudes toward their amputation by the subjects, the following procedure was used:

5.351 The Amputation Questionnaire --

This instrument was originally administered to collect prediction data, and a copy of it may be found in Appendix A-2.

5.352 Amputation Questionnaire Items --

The following items were extracted from the Amputation Questionnaire, and used as sources for criterion data:

(1) What do you think of the limb you are presently wearing?

(2) How does it feel while walking?

(3) It feels uncomfortable because . . .

(4) I can't use this leg properly because . . .

Part I

(5) How far can you walk on your leg comfortably?

(6) I have pain when I . . .

(7) Is there anything wrong with your artificial leg?

(8) They could improve my artificial leg by . . .

(9) They could improve my walk on this leg by . . .

(14) Do you think that you use your artificial leg well?

(15) How do you think that you could improve in the use of your leg?

(16) What important things are you prevented from doing because of your artificial leg?

(25) I know how to use my leg correctly___because . . .

(26) The thing that is wrong with artificial legs is . . .

(27) The leg handicaps me in my work ___.

(28) Because of my amputation, I had to change my kind of work ___.

(29) My former line of work was (before amputation) . . .

(30) My present line of work is . . .

(5) How long does your artificial leg last you?

Part II (6) For each part of the artificial leg listed below, indicate what problems you have met while using your leg, and what suggestions you have for improving each of the parts. (Tell us your experiences with each part of the leg.)

(2) How was your limb fitted?

(3) They didn't fit this leg correctly because . . .

Part III (20) Do you know what troubles are to be expected with wearing an artificial leg?

(21) Have they told you how to overcome them?

(23) Are there any services for your stump or leg you would like to receive (that are not available at present)?

(24) I think that I can still improve in the use of my leg?

(26) How many hours a day do you wear your artificial leg?

Chapter VI

6.0 METHODS OF DATA TREATMENT

6.10 Introduction

The research procedures employed in this study have yielded a wealth of data which require interpretation. It is clear that, because of the clinical orientation of the project, large numbers of both qualitative and quantitative data have emerged. Qualitative and quantitative data are inherently different and, therefore, demand different methods of treatment. On the whole, present statistical methods are adequate to the task of handling quantitative data; but current procedures for the management and reduction of qualitative data are only in an early stage of development. Wherever possible, we have employed standard statistical procedures in the treatment of research data, both prediction and criterion. It is only in the treatment of some of the qualitative information that we have utilized some newer and less well known procedures.

In the broadest sense, our task has been that of seeking to relate data which have emerged from the application of our testing instruments and techniques to our subjects to data which have resulted from the collection of certain criterion information about the subjects which are associated with such factors as their gait with a prosthetic device, their performance on achievement tests with their prosthesis, their job "adjustment", and certain criterion items from the Amputation Questionnaire.

6.20 Assignment of Responsibility

Responsibility for the treatment of certain of the research data was assigned to different members of the project staff to the end that a more complete and thorough method of handling the information collected might result.

Such responsibility was assigned in the following manner:

Mr. Sidney Levy was assigned the task of studying the relationships between the Rorschach, Bell Adjustment Inventory, and Wechsler-Bellevue Test of Adult Intelligence to efficiency in the use of the prosthetic device.

Mr. Sidney Fishman was given the task of studying the relationships between the Open-End Attitude Scale and the Guided Clinical Interview and the gait of the amputee with his prosthetic device, the Achievement Test ratings, Amputation Questionnaire criterion items, and Job Adjustment.

The full project staff has concerned itself with a consideration of all of the testing techniques in relation to the criterion information, but has not given attention to the Modified Thematic Apperception Test data and those from the Draw Two Men and a Woman and Tell a Story Test. Data from these two latter procedures will be subjected to subsequent study, and do not form a part of this report.

6.30 Detailed Procedures for the Treatment of Prediction Data

A number of different methods of scaling, scoring, and interpretation of the various prediction data were utilized, and those reported below represent the procedures which were finally agreed upon. Preliminary statistical methods, developed to probe certain limited hypotheses, are not reported upon. The final methods of

treating the data actually represent compromises in that they are not always fully adequate to the task, and yet at the same time are the most appropriate which are currently available to us.

The specific methods of treating each set of prediction data are outlined in some detail below.

6.31 The Biographical Information Blank

Since not all of the many separate items of this blank could be used, careful evaluation of the possibilities suggested that the following items might prove most useful, and these were selected for study:

(a) Mechanical interest

(b) Mechanical ability

(c) Introversion - extraversion

(d) Socio-economic status

(e) Hobby changes as a result of amputation

(f) Reading habit changes as a result of amputation

(g) Religious habit changes as a result of amputation

(h) Differences with members of the family

(i) Differences with friends

(j) Health

Each of these items was studied in relation to the criterion data in accordance with the procedure reported upon below in section 6.60.

6.32 Amputation Questionnaire

This instrument was not used to furnish prediction data, and the items which were taken out for criterion purposes were treated in accordance with the procedure outlined below in sections 6.42 and 6.60.

Section 6.33
Section 6.34
Section 6.35
Section 6.36
Section 6.37

6.33 Wechsler-Bellevue Test of Adult Intelligence

The tests were scored in accordance with the procedure recommended by Wechsler in the Third Edition of The Measurement of Adult Intelligence. Scores for the Verbal and Performance Scales of the Test were computed, but since the analysis indicated that they correlated very highly with the total test score, only the I.Q. scores on a total test basis were used.

6.34 Bell Adjustment Inventory

This instrument was scored in accordance with the technique prescribed by Bell (14, 15). The lower scores indicate better adjustment by the subject, and total scores only were used in the analysis.

6.35 P-S Experience Blank

The inventory was scored in accordance with the procedure recommended by Seitz and McFarland in their Manual of instructions. Since the two parts of the test were found to correlate highly with the total score, only the total score was used in the statistical analysis.

6.36 Rorschach Psychodiagnostic Test

The Rorschach Test was scored according to the procedure advocated by Klopfer (53), and interpreted in the manner recommended by him. A detailed statement of the methods of treatment of our Rorschach Test data is presented in section 6.62 below.

6.37 Open-End Attitude Scale

The Attitude Scale consists of fifty items which are scored on a five point scale, +2 to -2, in accordance with the procedure recommended by Rotter and Willerman. (See Appendix E-1).

6.38 Guided Clinical Interview

The Guided Clinical Interviews were recorded and independently listened to by two clinical psychologists, who completed a check sheet (See Appendix B-3). Each interview was analyzed into fifty-odd categories of attitudes and values. The rating procedure provided that each rating psychologist assign a plus score to any designated category for which evidence clearly supported the first polar alternative of that category. A minus score was used to indicate that the interview data clearly supported the opposite polar alternative of that category. A neutral score, 0, was provided for those cases in which (a) the evidence from the interview was too colorless or too self-contradictory to support either polar alternative, or (b) no evidence at all was elicited from the interview with pertinence to the category in question.

A preliminary analysis of the results of this procedure revealed that for many categories a number of subjects were receiving neutral scores, 0, either for the reasons cited above or because the ratings of the two psychologists were in opposition. The neutral scores could not logically be interpreted as representing some intermediate position on the continuum appropriate to the category, but rather in many instances they could be interpreted only as "missing data". For this reason, we decided not to attempt to arrive at total scores for the clinical interviews, but rather to analyze each category separately.

6.39 The Neurological Examinations and Sensory Exploration Studies

Many of the data from these studies were of a qualitative nature which did not lend themselves to statistical treatment. Certain por-

tions of the data, namely, two point discrimination, and the arm level finding test, which are of a quantitative kind, have been treated by means of simple statistical methods to ascertain whether there are any significant findings.

6.40 Detailed Procedures for the Treatment of Criterion Data

A number of different methods for handling and interpreting the complex criteria which we have employed were utilized, and those outlined below represent the procedures which were finally agreed upon. Because of the unusual and complex nature of our criteria, we have experienced considerable difficulty in handling them in accordance with established statistical procedures.

The specific methods for treating each set of criterion data are offered in some detail below.

6.41 Ratings of Gait

As originally planned, this was to be a composite rating by three judges, each expert, and made on the basis of motion pictures which had been taken of each subject. The judges arrived at a rating of good (0), fair (-1), or poor (-2) on each of the ten aspects of gait (See Appendix D-3). Intercorrelations of judges A, B, and C indicated that judges A and B had rated in substantial agreement (r = .82), but that judge C disagreed with them to a considerable degree (r's = .56 and .60). Investigations of standards used by the three judges in rating the subjects revealed that judge C had rated each subject in terms of what the subject's maximum performance could possibly be in consideration of the extent of his impairment. Inquiry revealed that the other two judges had applied

the same set of absolute standards to all subjects regardless of differences in their individual injuries and the presumptive differences these might have made in their performance in walking.

Since the latter type of rating was the one desired in this study, the ratings of judge C were eliminated from the composite rating on gait assigned to each subject. For purposes of statistical analysis, the ratings of the two judges were converted into z-scores and added.

6.42 The Amputation Questionnaire

Twenty-five items were scored on a five-point scale from -2 to +2, making the best possible score 50, and the lowest possible score -50.

6.43 Vocational Rating Report

This report was completed by only thirty subjects, those self- and unemployed having been unable to accomplish it. The best possible score was 100, and the lowest score was 0.

6.44 Achievement Test

Fourteen tasks were rated from 0 to 3 on the basis of the observed skill of the subject in performing the achievement tasks. Two tasks were rated 0 to 4, using time as the criterion. The best possible score was 50, and the lowest score possible was 0.

6.50 Detailed Procedures for Studying the Sample Population

A second sample of forty-eight above-the-knee amputees, representing approximately 10 per cent of the above-the-knee amputee veterans in the Metropolitan New York area, was selected for comparison with the experimental sample. The two samples were com-

pared with respect to age, height, weight, marital status, number of children, education, date of amputation, length of stump, and branch of military service.

A Chi-Square Test was applied to each of these variables to ascertain whether the two groups of subjects had been drawn from a random sampling of common population. As a standard of judgment for the Chi-Square Test, we adopted a level of confidence of 5 per cent, a procedure which assures us that any differences which are discovered may be regarded as having only 5 chances in 100 as being due to the operation of chance factors. In addition, computations were made at the 1 per cent and 10 per cent levels of confidence.

6.60 Statistical Procedures for Relating Prediction and Criterion Data

In this study, we have employed a variety of statistical methods for the purpose of treating the prediction and criterion data. Certain special statistical procedures were used to treat different portions of the data, and these are described below in 6.61, 6.62, and 6.63.

6.61 General Statistical Procedures

In this portion of the research, prediction data from the Wechsler-Bellevue, Bell Adjustment Inventory, Seitz-McFarland P-S Inventory, and the Open-End Attitude Scale were related to criterion data of amputee gait, achievement tests, Vocational Rating Report, and certain Amputation Questionnaire items of a criterion nature.

6.611 The Correlation Analyses --

A.

For the total group of forty-eight subjects having three criterion measures, and for the sub-group of thirty having the Vocational Rating Report as a fourth criterion measure, zero-order correlations were computed for the available criteria and the four predictor instruments by gross score methods. Where decimal or negative scores occurred, the scale for that variable was converted to a positive integer scale for ease of computation.

Since none of the intercorrelations were significant from zero (at the 5 per cent level of confidence), it was decided to consider each criterion separately, abandoning the original conception of a composite criterion to which the prediction data might be related. None of the validity coefficients for the larger group of forty-eight subjects were significant, and only one of those for the smaller group of thirty was significant.

It was originally planned to use multiple correlation procedures to ascertain which of the several prediction instruments were making the greatest contribution in predicting the criterion considered as a composite measure, but these plans had to be abandoned since none of the zero-order validity coefficients were significantly different from zero in both groups.

B.

It was decided to select from the sample of forty-eight subjects two extreme groups according to their "adjustment", and to investigate each category of the scored clinical interview in terms of

the new criterion. The high group consisted of thirteen subjects who ranked above the median on both the gait ratings and the selected Amputation Questionnaire criterion items; the low group of fifteen subjects who ranked below the median on both criteria.

Plus, neutral, and minus scores were tallied for these two groups on each item; and the results are presented in Table 7.50-3.

On only six of the fifty-odd categories were the majority of the subjects given minus scores, as follows:

1.16 Warm, demonstrative father --
stern, distant father

1.23 Genuine rivalry toward siblings --
little evident rivalry

1.32 Discipline which can be assimilated --
discipline threatening

2.1 Close --
distant relationships to people in general

2.2 Many --
few relationships to people in general

6.8 Strong self-regard --
weak self-regard

C.

The selected items of the Biographical Information Blank were treated in the same manner as the clinical interview categories. Items selected for study were:

Mechanical interest

Mechanical ability

Introversion

Economic status

Hobby changes

Reading habit changes

Religious habit changes

Differences with family

Differences with friends

Health

Scores on each item were related to the two criterion groups described in B. above and the results are reported in Table 7.50-4.

6.62 Special Quantitative Techniques Employed in the Treatment of the Rorschach Test, the Wechsler-Bellevue Test, and the Bell Adjustment Inventory in Relation to the Criterion of Gait

In this portion of the research project, twelve subjects who had been rated by the evaluation panel of judges as "good" walkers and twelve amputees who had been rated by the same group as "poor" walkers were intensively studied, principally by means of the Rorschach Test. In addition, the two groups were appraised by means of the Bell Adjustment Inventory and the Wechsler-Bellevue Test of Adult Intelligence.

The specific procedures for appraising the twenty-four subjects are outlined in detail in succeeding sections.

6.621 Quantitative and Qualitative Analysis of the Rorschach Test

A. Quantitative Evaluation

Thirty-seven Rorschach Test scoring components or factors were tabulated for the entire population of forty-eight subjects.

Mean scores for each factor were computed for the two criterion groups of "efficient" and "inefficient" users of prostheses. Differences in mean scores were calculated, and the t-test for significance was applied. (See Table 7.61-8.)

B. Qualitative Evaluation

The group of Rorschach Test scoring factors which had been found to be significant at the 1 per cent and 5 per cent levels of confidence as a result of the quantitative evaluation were qualitatively interpreted by means of a procedure which considered the differential occurence of the scoring factors among the Rorschach protocols of the members of the two criterion groups. (See Table 7.61-8.)

C. The Munroe Inspection Technique

The Rorschach Test protocols were analyzed in accordance with the Munroe Inspection Technique.* The t-test of significance was applied to the data from the two criterion groups. (See Table 7.61-9.)

6.622 Analysis of the Wechsler-Bellevue Test of Adult Intelligence

The Verbal, Performance, and Full-Scale I.Q. scores for the twelve subjects with highest prosthetic efficiency ratings were compared with similar scores of the twelve subjects with lowest prosthetic efficiency ratings. Means and standard deviations for the several sets of data were computed. Differences between the several sets of data were tested by the t-test of significance on the basis

* Munroe, R., "The Inspection Technique: A Method of Rapid Evaluation of the Rorschach Protocol," Rorschach Research Exchange, 1944, 8:46.

of the null hypothesis. (See Table 7.61-3.)

In addition to these comparisons of "good" and "poor" amputee gait performance, twelve subjects with the highest Wechsler-Bellevue Test scores on each of the three scales were compared with twelve subjects with lowest scores on the three scales.

In a similar manner, an analysis was made of the distribution of scores on each of the ten sub-tests of the Wechsler-Bellevue Test. Mean scores, differences between means, t-scores, and Pt-scores were calculated. (See Table 7.61-4.)

6.623 Analysis of Bell Adjustment Inventory

A comparison of the Bell Adjustment Inventory scores in each of the six areas measured by the instrument was made for the twelve "efficient" and the twelve "inefficient" walkers. For these data, t- and Pt-scores were computed.

The twelve subjects with the highest Bell Adjustment Inventory scores in each of the six areas or adjustment were compared with twelve subjects with the lowest Bell Adjustment Inventory scores on the six scales. Differences in means, t-scores, and Pt-scores were computed. (See Table 7.61-5.)

6.624 Analysis of the Criterion Data

A single criterion, that of the rating of the gait of the subjects, was employed in this part of the research study. Ratings of gait of the amputees, made by the evaluation panel, were tabulated in order of magnitude. Twelve subjects with lowest ratings and twelve subjects with highest ratings were chosen to constitute the membership of the criterion groups. (See Tables 7.61-1 and 7.61-2.)

6.63 Special Qualitative Techniques Employed in the Treatment of the Guided Clinical Interview, the Biographical Information Blank, and the Open-End Attitude Scale in Relation to the Criteria

6.631 Analysis of Guided Clinical Interview

A. Introduction

The clinical interview is a prediction instrument which is highly contaminated with criterion information, and this fact, in addition to the length of the interview, posed two difficult problems. Since the guided clinical interviews had been recorded, the criterion data were difficult to separate from the greater number of prediction data. Because it proved too time consuming and expensive, a decision not to transcribe and type the interviews had to be made. As regards the problem of contamination, each psychologist, aware of the difficulty involved, strove to maintain as objective an attitude as possible, and sought to utilize only prediction information. It was possible, and desirable, to replay portions of each interview to obtain further evidence to support or refute previously developed hypotheses as well as to provide data on the basis of which new hypotheses could be developed. By requiring two psychologists to analyze the clinical interview data independently, we hoped to offset, in part at least, the influence in interpretation which is due to the psychologist's educational background, theoretical orientation, and clinical experience.

Two clinical psychologists independently listened to each interview as a whole, writing down any hypotheses about the personality

of the subject, as well as any corroborative facts which could be used as a basis for the formulation of the hypotheses. A summary analysis of the personality of the subject was then developed. A sample of such analysis is as follows:

CLINICAL INTERVIEW
Subject X

X appears to be a gregarious immature person who has difficulty in accepting authority. His goals in life, sex adjustment, and relationships with people are more typical of the adolescent than of his actual chronological age. His major motivation towards baseball appears to stem from the fact that his specialization in this area has enabled him to receive a measure of recognition and responsibility. It also enables him to continue his sibling rivalry with an older brother who made a name for himself in sports. He has allowed his whole life to be circumscubed by his baseball activities, and has little insight or motivation towards developing his skills in other areas. He appears to be very self-centered. In sex relationships this manifests itself in depersonalized relationships to gratify his needs. He does not appear to have been markedly upset in his body concept by his injury.

B. Qualitative Analysis

After each personality description had been written, it was analyzed into a number of idiographic statements, listed, and then checked for agreement or disagreement. An example is reproduced, as follows:

CLINICAL INTERVIEW
Subject X

AGREEMENT

1. Strong need to have his own independence recognized
2. Sex act to meet own needs - depersonalized

DISAGREEMENT	Agree	Dis-Agree	Insuf Info
1. Little versus marked effect on body concept	1.		

UNMENTIONED	"A"	Agree	Dis-Agree	Insuf Info
1.	Warm affectionate to parents	1.	/	
2.	Pride in independence and break from religious ties indicate break in familial dependency ties	2. /		
3.	Belligerently self confident on the overt level	3.	/	
4.	Curtailed in baseball activity by the leg	4. /		
5.	Not satisfied with treatment received	5. /		
6.	Receives sex gratification (has intercourse)	6. /		
7.	Naive understanding of physiology of sex	7. /		
	"B"			
1.	Gregarious	1. /		
2.	Immature	2. /		
3.	Difficulty in accepting authority	3. /		
4.	Goals in life and adjustment typical of adolescent rather than true chronological age	4. /		
5.	Life circumscribed by baseball activities because of recognition and responsibility he achieves there	5. /		
6.	Sibling rivalry	6.		/
7.	Little insight into his problems	7. /		
8.	Little motivation to develop himself in other areas	8. /		
9.	Very self centered	9. /		
10.	Sex relationships depersonalized to meet his needs	10. /		

The results of this analysis revealed that of 974 statements made about the personalities of the subjects, approximately 15 per cent of them were in agreement, about 2.7 per cent were in disagreement, and the remainder, 82.3 per cent, were statements which had been mentioned by one psychologist only. Although there are five times as many statements for which agreement had been obtained as there are disagreements, the large number of statements that were

mentioned by only one psychologist and not by another makes this measure somewhat insignificant in comparison. Some of the statements might not have been mentioned because, in the opinion of the psychologist, no evidence existed in the clinical interview to support them, or because they had simply been overlooked. The next step increased the per cents of agreements or disagreements by requiring each psychologist to review statements which he had not made but which had been made by the other psychologist. A statement sheet for each amputee, containing the items which had been unmentioned by the other analyst, was given to each psychologist, who was asked whether he would agree, disagree, or state that insufficient evidence existed on the basis of which to comment. This procedure resulted in raising the agreements from 15 per cent to 86 per cent; the disagreements to 8.5 per cent; and the remaining items were all in the insufficient information category.

6.632 Analysis of Open-End Attitude Scale

This specially constructed instrument is a fifty item blank which provides key stimulus phrases in various areas of personal and social adjustment which are to elicit unstructured responses from the subjects concerning their attitudes.

A pilot study of ten attitude scales was undertaken to furnish information to the research supervisor as a basis for discussion of the scoring and use of the Open-End Attitude Scale. A preliminary procedure for evaluating the data was developed, and involved the following steps:

(1) A perusal of the entire attitude scale by a staff psychologist

(2) The tentative selection of items thought to be significant for prediction

(3) The interpretation of the items chosen

(4) The development of a personality summary based on the interpretation

(5) The development of a prediction statement as to whether or not the subject was likely to adjust well to his prosthesis.

Experience with several cases revealed that steps two and three above were unnecessary. Insights were developed during this scoring procedure which revealed weaknesses in the design of the attitude scale. Analyses were found, for example, to be influenced by the educational background and theoretical orientation of the examining and scoring psychologist. Questions as to the reliability of the instrument arose. Further experience with the scale suggested that some of its items were so structured by the subject as to reveal certain crucial criterion data; e.g., direct complaints concerning the prosthesis, remarks pertinent to the ability of the subject to use his artificial limb well or poorly, etc.

To avoid any contamination of the prediction data by criterion data, a staff member deleted all information contained in the attitude scales which fit our definition of criterion data. To increase the reliability of the analyses of the instrument, the following procedure was adopted:

(1) Two staff psychologists independently analyzed the data to increase the reliability of analysis.

(2) Personality summaries were written by the psychologists independently for use in the validation study, and an example is reproduced below:

ATTITUDE SCALE
Subject X

A man who is not too intelligent nor well educated, who is considerably cautious and non-commital about his own personal feelings. His defensive attitude enables him to maintain an overt appearance of self-sufficiency and independence, that probably belies the disturbance underneath. Fond of his mother, he indicates no attitude towards his father. His thoughts are politically and socially immature, as well as completely egocentric in nature. There exists some resentment towards the physicians who treated him that is probably resentment against the amputation. He is socially reticent although conscious of his own needs. He evidences no general resentment toward people, and feels quite satisfied with the way in which they have treated them. He is fond of sports, particularly baseball, which occupies a large part of his thinking. The attitude towards physicians is carried over more actively against bosses, so that the non-expression of the attitude towards the father, is probably explained as resentment and hostility that has been repressed. Discontent with his work, he plans to change the nature of his vocation, marry, and hopes to have a home of his own.

I do not believe that he adjusts well to his prosthesis.

"B"

A procedure similar to that used for checking the reliability of the clinical interview interpretations was employed with the Open-End Attitude Scale -- <u>see</u> Section 6.631 -- with the following results:

(1) Of 1320 prediction statements made, there was initial agreement on about 21 per cent of the statements, initial disagreement for approximately 3 per cent, and about 74 per cent of the statements were mentioned by one psychologist and not by the other.

(2) After both psychologists reviewed all statements which had been mentioned by one psychologist only and not by the other, the agreement rose from 21 per cent to 76 per cent; the disagreement from

3 per cent to 12 per cent; and the statements for which there was insufficient evidence on the basis of which to write a prediction statement accounted for about 14 per cent. This final percentage of agreement and disagreement was used as a rough measure of reliability.

6.633 The Biographical Information Blank

A separate personality description was developed on the basis of the items in this blank, and an example is reproduced here:

BIOGRAPHICAL INFORMATION BLANK
Subject X

X, 22-7, is the youngest child of a family of four (including parents) whose financial status was approximately average. His relations with his family were excellent. He attended church occasionally as a child, and still does now. At 17 he left school because he wanted to join the service. He was active in all sports in high school, and is still interested in all sports, particularly baseball. For 8 years he has managed a baseball team for the Knights of Pythias.

He is employed as an Awards Accounts Clerk by the Veterans Administration, in a job which he dislikes. The income is adequate for his needs, and he has moderate savings. An extroverted person, he has many male friends, and is engaged. He is not satisfied with his parents' attitude towards him, but does not indicate why. Similarly, he reports his health is very good, but states that he is presently under medical care.

"B"

Since the instrument consists of highly structured and definitive items, only one staff psychologist was used to develop the descriptive material, because no question of reliability was involved.

6.634 Analysis of Criterion Data

A. Amputation Questionnaire

This instrument contained items of a prediction nature, along with criterion items and some non-essential items. To eliminate the prediction items and the non-essential items, a psychologist reviewed all of the questionnaire items, and selected only items of a criterion nature. These were included in a descriptive summary of the amputee's attitude towards his prosthesis, complaints about mechanical defects, and reports of breakages.

B. Evaluation of Gait

The movies of the amputee's locomotion in test situations devised by the Engineering division were rated by a board consisting of an anatomist, physiotherapist, and an orthopedic surgeon. The ratings were made on a check list which required the judges to check specific aspects of the man's gait. A qualitative description was written based upon the combined ratings of the judges.

C. Vocational Rating Blank

A description of the amputee's quality of work, relationship with other employees and his employer, his use of his amputation to avoid work, and certain personality factors perceived by his employer was written from the rating scales that had been made by the man's employer.

All of the three descriptions were compressed into one integrated descriptive summary which was the criterion sheet employed in the matching technique. A sample criterion statement is reproduced, as follows:

CRITERION STATEMENT
Subject X

This amputee finds his prosthesis so unsatisfactory that he uses his crutches all day. In addition he does not know what troubles are to be expected with wearing an artificial limb, nor how to overcome any that might arise.

When wearing his artificial leg, however, he states that he has difficulty because of his fatty stump which prevents him from getting a good fit. Despite the musculature of his stump he feels that his leg could be improved if better service were supplied to him with special attention to the fit.

He is not a good walker, and has some difficulty with his arm swing - decreasing it on the prosthetic side, and increasing it on his normal side. There also is a tendency to increase the lumbar curvature when transferring his weight to his artificial limb. His walk, he believes, could be improved if he had a lighter leg.

He is prevented from participating in sports and walking stairs. It was also necessary for him to change his occupation because of his amputation. He is no longer handicapped in his work as a Veterans Administration clerk. After ten months of service, this amputee has proven himself to be an inspirer of personal loyalty who shows superior self-assurance. Although he also seems to be over sensitive and easily disconcerted, he gets along well with other employees.

His work record is good indicating that he does what is expected of him with few errors. He has demonstrated that he can profit from experience and is expected to continue to do so with the usual prospects for advancement. He is occasionally absent from work, but never uses his amputation as an excuse to avoid work. In the light of his personal characteristics this man would be recommended with confidence for his job.

D. Study of the Prediction and Criterion Data

The prediction and criterion data were treated in two parts so that the analytical procedure was accomplished independently for

two groups of twenty-four cases each. The findings from each of the groups were formulated separately so that results of two distinct analyses of prediction instruments were available. The anlyses were kept separate so that their usefulness might be checked against the other half of the data.

After the judges had completed their matchings, the results of the matchings were tested for their significance against chance expectations by an application of the binomial expansion theorem. Since there were three categories available to the judges, the probability of all of the judges matching a statement for one case in the triad was computed as follows:

$$(p \text{ plus } q)^{20}$$

where p is the probability of obtaining the favorable event, in this instance 1/3, and q is the probability of obtaining an unfavorable event, in this instance 2/3. Twenty represents the number of judges who were used for testing each prediction statement.

The first term of the expansion indicates the probability that all twenty judges will match the statement correctly, so that p^{20} equals $(1/3)^{20}$. Since this fraction is less than 1/100, or the 1 per cent level of significance, the result can be considered a significant departure from chance expectations. The same procedure was used for any results which had been obtained.

A tabulation was made of the number of correct statements made about each subject. Since there were fifteen prediction statements about each amputee, chance expectations allowed five

correct statements to be made. By means of the test indicated below, significant departures from chance were ascertained:

$$X = \Sigma \frac{(x-\bar{x})^2}{\sigma^2} = \Sigma \frac{(x-\bar{x})^2}{Npq}$$

x - number of correct statements

$\bar{x}$ - mean number of correct statements possible due to chance

σ - variance of distribution

N - number of statements

p - probability of favorable event occuring

q - probability of unfavorable event occuring

The results obtained by application of this formula are distributed in a manner similar to Chi Square. One simply enters the Chi Square Table at the appropriate number of degrees of freedom and obtains the probability that the results obtained depart significantly from the number of correct statements possible if the judges were simply guessing.

An analysis of the judges' distribution of responses, as well as the distribution of the statements was made by application of the above formula.

The statements were finally reviewed to ascertain why some statements were good predictions and others bad, to enable the psychologist's to learn what personality dynamics are important in the prediction of an amputee's adjustment to his prosthesis.

It must be emphasized that little attempt has been made to predict whether or not an amputee uses his leg well. We assume that the use of a leg by an amputee depends upon a wide variety of factors, among which are the length of his stump, the musculature available to him, the amount of training he has had in walking with his prosthesis, the fit of the artificial limb, previous experience with prosthetic devices, personality factors, etc. We can only hope, by the procedure described above, to indicate the possible role which some personality factors have in relation to the other factors listed in the criterion. On these grounds, it seems safer for us to attempt prediction as to how an amputee adjusts to his prosthesis rather than to predict whether he will use an artificial limb well or poorly.

6.635 The Validation Design

A. Introduction

A method for analysing the data was adopted which is essentially a modification of the Cronbach Technique.* Although it was not entirely statistical, in the usual sense, it was nevertheless objective and quantitative. This technique was originally adopted because of the fact that qualitative personality data simply do not lend themselves to any statistical methods available to us at the present time. Data for prediction came not only from the Guided Clinical Interview, but also from the Open-End Attitude Scale and the Biographical Information Blank. Criterion data in this portion of the study consisted of certain items from the Amputation Ques-

* See "A Validation Design for Personality Study," by Lee J. Cronbach, University of Chicago. (Unpublished)

tionnaire, motion picture evaluations of the subjects' gait, and the Vocational Rating Report. All of the criterion data were combined into one descriptive summary. (See section 6.634.)

A group of three psychologists met to cast predictions for use in the validation study. The three psychologists read the Biographical Information Blank analysis, the analysis of the Open-End Attitude Scale, and the Guided Clinical Interview analysis, discussed the case thoroughly, and attempted to arrive at a picture of the amputee's personality. The investigators reconciled any inconsistencies which had been caused by the fact that the several testing instruments and procedures assess personality at various levels, and sought to develop a congruent portrait of the subject. From this framework, predictions were cast in the form of complex statements that contained personality dynamics from each of the instruments and techniques.

If unanimity was not obtained, either no prediction was cast or a prediction was made by the two concurring psychologists. An example of this is reproduced below:

		Section 6.635		
		16	27	42
1.	BELIEVES HE USES HIS LEG WELL.// Egocentricity.			
2.	DOESN'T FEEL LEG HANDICAPS HIM IN HIS WORK.// Need for sense of independence and self-regard.			
3.	DOES NOT THINK LEG CAN BE USED PROPERLY BECAUSE OF POOR WORKMANSHIP, MATERIALS, KNOWLEDGE, etc.// Hostility due to severe blow to self-image.			
4.	HE CANNOT WALK ON HIS LEG COMFORTABLY.// Need for sympathy from others to support dependency need.			
5.	WOULD LIKE ADDITIONAL SERVICES FOR LEG.// Need for catering to by others.			
6.	THE LEG DOES NOT HANDICAP HIM IN HIS WORK.// Desire for independence and no desire for personal-type complaints.			
7.	BELIEVES HE USES LEG CORRECTLY.// High self-esteem.			
8.	PROBABLY WALKS POORLY.// Negative effect towards limb which would curtail any efforts to use it well.			
9.	FEELS LEG IS POOR.// Egocentric, resentful, hostile to authority person.			
10.	WOULD LIKE ADDITIONAL SERVICES FOR LEG.// Dependent needs and desire for help from others.			
11.	LEG HANDICAPS HIM IN HIS WORK.// Rationalizes lack of ability and application to job.			
12.	BELIEVES THE THINGS WRONG WITH ARTIFICIAL LEGS ARE NUMEROUS, MECHANICAL PROBLEMS.// Permits aggression in a non-threatening, safe area.			
13.	WOULD COMPLAIN CONSIDERABLY ABOUT LIMB.// Hostility and non-acceptance of status.			
14.	THEY COULD IMPROVE MY LEG AND WALK ON IT BY A BETTER LEG AND BETTER TRAINING.// Projection of blame on others and absolution of self from responsibility.			
15.	FEELS HE CAN IMPROVE IN USE OF LEG.// High level of goals in all areas.			

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		16	27	42
16.	HE WOULD CONSIDER HIS LIMB TO BE FAIR.// Too insecure to express direct evaluative complaints about leg.			
17.	IS PREVENTED FROM PARTICIPATING IN SOCIAL ACTIVITIES.// Rationalization of social insecurity.			
18.	FEELS LEG CANNOT BE USED PROPERLY DUE TO ACCEPTABLE, MINOR REASONS.// No expression of threatening ideas possible.			
19.	KNOWS THE TROUBLES TO BE EXPECTED WITH AN ARTIFICIAL LEG.// Need to maintain status in insecure person.			
20.	PREVENTED BY LEG FROM PARTICIPATION IN SPORTS.// Important loss in area of real interest.			
21.	BELIEVES LEG WAS POORLY FITTED BECAUSE OF INEFFECTIVENESS OF LIMBFITTERS.// Projection of hostility on other people.			
22.	WOULD LIKE TO IMPROVE IN THE USE OF LEG WITH HELP.// Need for sympathy and external aid by dependent person.			
23.	FEELS THERE ARE MANY THINGS WRONG WITH THE LEG AND LISTS MANY OF THEM IN DETAIL.// Expression of sarcastic hostility towards people and things.			
24.	HE FEELS THE LIMB IS POORLY FITTED.// An expression of hostility and desire for help.			
25.	BELIEVES HIS LEG IS FAIRLY GOOD.// A person who rationalizes hostilities and expresses ego-inflating values.			
26.	IS PREVENTED FROM WORKING BECAUSE OF HIS AMPUTATION.// Hostility and rationalization of lack of incentive to work.			
27.	FEELS HIS LEG IS COMFORTABLE TO WEAR.// Air of bravado as an indication of independence.			
28.	IS PREVENTED FROM PARTICIPATING IN SOCIAL ACTIVITIES. Reality factor in an area of major interest.			
29.	HE WOULD CONSIDER THE LEG TO BE UNCOMFORTABLE.// Embittered, hostile, poorly adjusted person expressing aggression.			
30.	FEELS HIS LEG IS WELL FITTED.// No personalized aggression.			

The predictions resulting from this procedure which utilized the personality descriptions of the subject were made into individual statements, and the criterion information was prepared into one descriptive summary. Three pilot cases were then selected, and a composite statement sheet, containing twenty-nine descriptive prediction statements gathered from the three cases, was developed. A pilot study using these cases and employing sixty undergraduate psychology majors at Brooklyn College was accomplished, as follows:

B. The Pilot Study

Thirty students were given statement sheets containing the twenty-nine prediction statements and a criterion summary of one amputee. Ten of the students were asked to indicate on a separate sheet whether each of the twenty-nine statements was characteristic of Subject A (the criterion summary offered was that of Subject A), not characteristic, or if there were no data on which to make a judgment. Ten students were asked to perform the same task for Subject B, and ten others for Subject C. Thirty other students were given all three criterion sheets -- A, B, and C -- and asked to check on a specially prepared list whether each statement was characteristic of A, B, or C; none of them; or if there were no data on the basis of which to make a judgment.

Only ten of the statements proved to be sufficiently characteristic of the subjects to enable the judges to make correct matches. Seven of these were made for one man, three for another, and no correct matches were made for the third. Analysis revealed the following reasons for the incorrect matchings:

(1) The prediction statements in many cases were far too complex. Students reported that they could validate one part of the statement, and yet disagree with the other. Since they were asked to judge whole statements, disagreement would be indicated on the basis of the conflicting part.

(2) When personality dynamics were included in the prediction statements, confusion resulted when students attempted to validate dynamics. Unable to find personality dynamics on the criterion sheet, they would reject the statement.

(3) The time was insufficient for the second group of thirty judges to do an adequate job of matching.

(4) It also became apparent that if one strong criterion were present in the triad, more statements were likely to be matched with it, a procedure which caused a greater number of correct matchings to be made for that subject.

On the basis of the trial study, a decision was made to ask each judge to compare three cases at one sitting, and thereby reduce the number of judges originally required in the Cronbach Technique. The criterion information was used as a guide in the development of prediction statements -- e.g., if the criterion statement contained a comment about the ability of the subject to get along well with others on the job, we attempted to make a prediction in that area using an item from the Vocational Rating Report as a guide for expression. The dynamics were made a separate part of the prediction statements, and these were employed as supplemental information for the judges, but were to be disregarded if they conflicted with the behavioral predictions.

C. Summary of the Modified Procedure

(1) Predictions, which were cast originally in the form of descriptions of the personalities of the subjects, are separated into statements and structured into criterion form.

(2) Cases are grouped into sets of three by random. All possible identifiers are removed from the statements. For each triad, one statement sheet is prepared. Each sheet is made by randomly mixing prediction statements made for three cases. Triads are constructed on the basis of length of the criterion statements -- i.e., cases having criterion statements of the same length are placed in single triads. This is done to overcome the tendency of the judges to match statements with the longest criteria in the triad.

(3) Judges are given the criterion description for each of the three cases, and are asked to rate each statement as "characteristic of Subject A," "characteristic of Subject B," or "characteristic of Subject C."

Chapter VII

7.0 PRESENTATION OF THE RESEARCH DATA

7.10 Introduction

In this chapter, we present in detail the full research data on the basis of which the Findings in Chapter III, and from which the Conclusions and Recommendations in Chapter IV have emerged. Certain implications of the research data are developed in Chapter VIII, which should be considered in relation to the data presented here.

For many reasons, it has seemed desirable to us to offer these data in full. Chief among these considerations is the hope that the data which we have collected may be reworked within the present context as well as utilized in connection with certain other studies, both continuing and planned. As has been mentioned previously, not all of the data collected in this research have been employed in the present study; and only such of the data as have been utilized in the major study, as well as in the two segmental inquiries, have been made available at this time. Data from the Thematic Apperception Test and from the Draw Two Men and a Woman and Tell a Story Test are not included.

7.20 Characteristics of the Sample Population

Tables

Table 7.20-1

7.20-1 Summary of Characteristics of the Sample Population of Forty-eight Amputees

AGE: Range 22 - 40

Mean 28 1/4

Mode 24 and 27 (7 each)

22 - 1	30 - 4
23 - 4	31 - 1
24 - 7	32 - 2
25 - 2	34 - 2
26 - 4	35 - 2
27 - 7	36 - 2
28 - 4	39 - 1
29 - 4	40 - 1

Total 48

HEIGHT: Range 5'2" - 6'3"

Mean 5'6 1/4"

Mode 6'0"

WEIGHT: Range 120 lbs. - 205 lbs.

Mean 162½ lbs.

Mode 150 lbs.

MARRIED: Married 26 54%

Single 22 46%

CHILDREN:

None	6
1 Child	10
2 Children	8
3 Children	1

% married who have children - 76%

Average number of children - 1.2

Summary of Characteristics of the Sample Population of Forty-eight Amputees (Continued)

RELIGION:	Catholic	24	50%
	Jewish	14	29%
	Protestant	10	21%

EDUCATION:

Range 6 - 16 years

Mean 11 1/4 years

Mode 12 years

6 years	2	12 years	16
8 "	3	13 "	7
7 "	1	14 "	1
9 "	3	15 "	1
10 "	6	16 "	2
11 "	6		

BRANCH OF SERVICE:	Army	46	95%
	Navy	2	5%

COMBAT:	Yes	47	97%
	No	1	3%

LENGTH OF STUMP:

Range $4\frac{1}{2}$" - 16"

Mean 9"

Mode 10"

$4\frac{1}{2}$	1	10	7
5	3	10 1/4	1
6	5	11	2
$6\frac{1}{2}$	1	12	3
7	6	13	5
$7\frac{1}{4}$	1	14	2
$7\frac{3}{4}$	1	15	2
8	2	16	1
9	4		

Summary of Characteristics of the Sample Population of Forty-eight Amputees (Continued)

DATE OF AMPUTATION:

Range	7/41 - 10/45	7/41 - 1 1/43 7
Mean	9/44	7/43 4 1/44 6
Mode	6,8/44 (5 each)	7/44 15 1/45 13 7/45 2

DATE OF FITTING:

Range	9/41 - 6/46	7/41 - 1 7/43 2
Mean	4/45	1/44 4 7/44 8
Mode	6/45	1/45 19 7/45 12 1/46 1

VOCATIONAL STATUS:

PRE-AMPUTATION:

0	Professional and managerial	- 7
1	Clerical and sales	4
2	Service	1
3	Agricultural and kindred occ.	0
4	Skilled	6
5	Skilled	8
6	Semiskilled	5
7	Semiskilled	4
8	Unskilled	9
10	Students	1

(See Dictionary of Occupational Titles)

POST-AMPUTATION:

0	Professional and managerial	- 5
1	Clerical and sales	16
2	Service	2
3	Agricultural and kindred occ.	0
4	Skilled	14
5	Skilled	0
6	Semiskilled	1
7	Semiskilled	0
8	Unskilled	0
10	Students	4

Total 42

Table 7.20-2

7.20-2 Comparison of Experimental Subjects with Another Sample of Forty-eight Amputees

	A	B	Chi-Square
Age			
30 - 41	15	19	0.84
26 - 29	19	12	4.08
20 - 25	14	17	0.53
Mean Sigma	28.3 (4.4)	27.8 (8.8)	5.45
Height			
6'0" - 6'3"	15	5	12.80
5'8" - 5'11"	21	28	1.75
5'2" - 5'7"	14	15	0.07
Mean Sigma	5'9" (2.8")	5'9" (2.7")	14.62
Weight			
180 - 219	11	10	0.10
150 - 179	25	24	0.04
120 - 149	12	14	0.29
Mean Sigma	165.2 (19.9)	165.8 (20.3)	0.43
Marital Status			
Married	26	25	0.39
Single	22	24	0.17
Divorced	0	1	1.00
Married	54%	48%	1.56
Children *	(26 M)	(24 M)	
None	6	4	0.64
One	10	7	0.77
Two	8	7	0.02
Three or more	1	6	4.65
Mean	1.1	1.8	6.08

* May list dependents other than children

Comparison of Experimental Subjects with Another Sample of Forty-eight Amputees (Concluded)

	A	B	Chi-Square
Religion			
Catholic	24	Not	
Jewish	14	report-	
Protestant	10	ed	
Education			
Coll. Grad. or more	2	4	1.00
Some college	7	8	.12
H.S. Grad.	16	19	.47
Some H.S.	17	11	3.27
H.S.	6	6	0.00
			4.86
Date of Amputation			
4 years or more	13	7	5.14
$3\frac{1}{2}$ - 4	19	18	0.06
3 - $3\frac{1}{2}$	12	19	2.58
$2\frac{1}{2}$ - 3	4	4	0.00
			7.78
Length of Stump			
13" or more	10	3	16.33
10 - 12	13	10	0.90
7 - 9	14	27	6.26
6 or less	10	7	1.29
			24.78
Branch of Service			
Army	46	41	0.61
Navy	2	5	1.80
Marines	0	2	2.00
			4.41

Comparison of two 10% samples

A - Experimental Sample - N=48
B - Independent Sample - N=48

Age, Height, Weight, and Other Data Descriptive of the Experimental Population (Continued)

Subject Case No.	Age	Height	Weight	Height Weight Ratio	Marital Status	No.of children	Education	Date Amputated	No.of months between amputation and 5/1/48	Date of prosthetic fitting	No.of months between amputation and fitting	Length of Stump	Stump Height Ratio
XIV	27	71	165	2.30	M	1	13	9-43	56	9-45	24	13	18
XV	29	69	150	2.17	M	-	16	12-43	53	3-44	3	8	12
XVI	30	71	150	2.11	M	1	16	6-43	59	6-44	12	7.5	11
XVII	31	70	155	2.21	M	2	12	11-44	42	6-45	7	6.5	9
XVIII	25	68	195	2.87	S	-	12	7-44	46	2-45	7	9.5	14
XIX	25	75	203	2.82	S	-	11	10-44	43	12-45	14	6	8
XX	24	67	150	2.25	S	-	13	7-44	46	12-44	5	5	7
XXI	28	70	175	2.50	M	-	12	6-45	35	9-45	3	11	16
XXII	32	67	130	1.94	M	1	8	3-45	38	5-45	2	11	16
XXIII	25	72	140	1.94	S	-	10	2-43	63	12-43	10	7	10
XXIV	28	68	175	2.57	S	-	12	6-44	47	6-45	12	7	10
XXV	32	71	160	2.25	M	2	8	1-45	40	4-45	3	10	14
XXVI	27	66	160	2.42	S	-	10	8-44	45	6-45	10	12	18
XXVII	40	67	140	2.09	S	-	11	6-43	59	3-44	9	10	15
XXVIII	24	73	167	2.32	M	1	12	7-45	34	9-45	2	10.5	14

Table 7.20-3

7.20-3 Age, Height, Weight, and Other Data Descriptive of the Experimental Population

Subject Case No.	Age	Height	Weight	Height Weight Ratio	Marital Status	No.of children	Education	Date Amputated	No.of months between amputation and 5/1/48	Date of prosthetic fitting	No.of months between amputation and fitting	Length of Stump	Stump Height Ratio
I	29	66	145	2.20	M	1	12	2-45	63	2-45	24	10	15
II	36	69	165	2.39	S	-	6	4-45	37	10-45	6	9	13
III	39	65	150	2.31	M	2	13	9-43	56	9-44	12	9	14
IV	27	72	196	2.72	M	2	11	1-45	40	6-45	5	15	21
V	24	68	145	2.13	S	-	12	5-45	36	6-45	1	7	10
VI	24	68	187	2.75	S	-	12	1-45	40	11-45	10	14	21
VII	35	71	175	2.46	M	2	11	7-44	46	2-45	7	10	14
VIII	30	73	180	2.50	S	-	12	9-44	44	4-45	7	7	10
IX	22	69	130	1.88	S	-	11	6-45	35	6-46	12	6	9
X	26	73	150	2.08	M	-	6	7-41	82	9-41	2	5	7
XI	26	67	130	1.94	S	-	7	10-44	43	8-45	10	10	15
XII	34	70	175	2.50	M	1	9	6-44	47	12-44	6	12	17
XIII	28	75	175	2.33	M	2	12	4-45	61	12-44	20	9	12

Age, Height, Weight, and Other Data Descriptive of the Experimental Population (Concluded)

Subject Case No.	Age	Height	Weight	Height Weight Ratio	Marital Status	No.of children	Education	Date Amputated	No.of months between amputation and 5/1/48	Date of prosthetic fitting	No.of months between amputation and fitting	Length of Stump	Stump Height Ratio
XLIII	34	64	145	2.27	M	1	10	8-44	45	1-45	5	7	11
XLIV	30	68	140	2.06	M	1	8	3-43	62	3-44	12	13	19
XLV	27	73	198	2.75	M	3	11	2-44	51	10-44	8	14	19
XLVI	24	70	180	2.57	S	-	14	1-45	40	4-45	3	15	21
XLVII	24	73	184	2.56	S	-	9	12-43	53			13	18
XLVIII	27	69	165	2.39	S	-	12	8-44	45	7-45	11	5	7

N = 48 Research Subjects Group A

Age, Height, Weight, and Other Data Descriptive of the Experimental Population (Continued)

Subject Case No.	Age	Height	Weight	Height Weight Ratio	Marital Status	No.of children	Education	Date Amputated	No.of months between amputation and 5/1/48	Date of prosthetic fitting	No.of months between amputation and fitting	Length of Stump	Stump Height Ratio
XXIX	23	66	120	1.82	M	1	12	3-45	38	4-45	1	12	18
XXX	29	69	162	2.35	S	-	9	5-43	60	9-43	4	7	10
XXXI	29	69	175	2.53	M	1	10	8-44	45	12-45	16	6	9
XXXII	36	73	180	2.50	M	2	12	9-44	44	7-45	10	13	18
XXXIII	27	73	165	2.29	M	-	10	7-44	46	2-45	7	4.5	6
XXXIV	25	73	165	2.29	S	-	10	2-45	39	4-45	2	10	14
XXXV	27	67	150	2.24	S	-	15	6-44	47	3-45	9	6	9
XXXVI	35	66	162	2.45	M	-	13	6-44	47	1-45	7	10	15
XXXVII	24	62	125	2.01	S	-	12	12-44	41	8-45	8	7.7	12
XXXVIII	30	74	202	2.73	M	2	11	3-45	38	6-45	3	16	22
XXXIX	28	66	150	2.27	M	-	11	3-45	38	12-45	9	6	9
XL	26	71	180	2.54	S	-	12	10-45	31	12-45	2	9	13
XLI	26	65	130	2.00	S	-	12	8-44	45	9-44	1	8	12
XLII	23	70	155	2.21	M	1	13	6-44	47	10-44	4	13	19

TABLE 7.20-4

SUMMARY OF NEUROLOGICAL DATA OBTAINED ON FORTY SUBJECTS

CASE NO.	NEUROLOGICAL EXAM	EFFECTS OF ETHYL CHLORIDE	LOCATION OF PARTS OF MISSING LIMB NORMAL	LOCATION OF PARTS OF MISSING LIMB POOR	POSITION INTO WHICH PROS. OR STUMP WERE PLACED WELL BY NORMAL LEG	POSITION INTO WHICH PROS. OR STUMP WERE PLACED POORLY BY NORMAL LEG	L. E. V. WITH PROSTHESIS R	L. E. V. WITH PROSTHESIS L	L. E. V. WITHOUT PROSTHESIS R	L. E. V. WITHOUT PROSTHESIS L	GRIP WITH PROSTHESIS R	GRIP WITH PROSTHESIS L	GRIP WITHOUT PROSTHESIS R	GRIP WITHOUT PROSTHESIS L	TRANSVERSE MEASUREMENTS OF STUMP	TRANSVERSE MEASUREMENTS OF SOUND LEG	LONGITUDINAL MEASUREMENTS OF STUMP	LONGITUDINAL MEASUREMENTS OF SOUND LEG	PHANTOM LIMB PRESENT	BAROGNOSIS THRESHOLDS WITH PROSTHESIS	BAROGNOSIS THRESHOLDS WITHOUT PROSTHESIS
1	N	/	-	-	C		1	0			-	-	-	-	1.8	3.8	3.0	5.5	0	No Significant Change	
2	N	-	-	-	0		-2	1	-2	1	-	-	-	-	2.5	6.0	3.5	7.5	0	-	-
3	N	-	Ankle & Toe	Heel 2" Above Prox. Knee		Overflexed at Hip and Knee	2	3	1	1½	30-39	25-28	-	-	-	-	-	-	Without Prosthesis	No Difference	Overestimates Knee Shifts
4	N Slight Exception	/	0		0		-	-	-	-	-	-	-	-	3.5	4.0	6.5	6.5	0	-	-
5		X		0 Knee and Ankle	Hip and Knee Poor	0	1	1	2	0	45-48	49-51	44-49	45-49	1.0	3.0	1.0	3.0	0	Normal	Bad
6	A	/	Well without Prosthesis	Poor with Prosthesis	Well without Prosthesis	Poor with Prosthesis	-	-	-	-	-	-	-	-	1.5	2.0	2.5	1.5	0	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	N	/	0		0		-	-	3	-3	-	-	63	55	2	5	2	4	0	-	-
9	N	-	0		0		2	1	-½	0	47	55	-	-	1.0	3.0	1.0	3.0	0	-	-
10	N Slight Exception	-		0		0	0	2	0	2	66	66	-	-	3.0	4.5	5.0	5.5	0	-	-
11	N Slight Exception	/	0			0	2½	2½	3	-1	46, 42, 32	40, 37, 37	64, 54, 61	61, 52 56	3.5	3.5	5.0	3.5	Fleeting	Below Normal	Accuracy Increased without Prosthesis
12	N	-	0		0		3	3	2	2½	33-48	42-38	57-43	44-39	1.0	2.5	7.1	2.0	0	Ability Approx. ½	JND Below Standard
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	N	/		0		0	3	2½	2	2	58	56	65	56	2	3	2	4	0	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	A	-	0		0		1	0	1	0	80	42	81	41	2	3	2	2	0	-	Great Variation
17	N	/	Right Hand & Heel	With Left Poor	-	-	3	2	3½	2½	40	68	-	-	2	2	4	4	0	No Significant Deviation	
18	N	-	Ankle and Toes	0 Knee		0	2	-1	1½	2	37	35	29	28	1.5	3	3.5	2.5	0	No Significant Deviation	
19	N Slight Exception	-	0		0		6	2	0	0	56, 52, 50	56, 52, 46	47, 52, 55	53, 46, 55	1.0	2.0	1.5	3.5	0	-	-
20	N	/	0		0		1	2	1	2	62	52	61	52	6	3	8	7	0	No Significant Effect	Greater Variation
21	N End of Stump	X	Done well except Tip of Stump		Fork on Pros. as if on Ankle or ft.		6	0	0	-½	51, 59, 59	54, 55, 54	58, 56, 54	36, 55 40	2.0	3.5	2.0	3.5	0	Below Normal	-
22		-		0		Stump Placed Higher	0	2	-	-	-	-	-	-	2.5	5.0	2.5	5.5	0	-	-
23	N	-	-	-	-	-	5	2	3	-1	46, 48, 44	38, 38, 35	46, 45, 39	41, 37, 32	2.0	5.0	2.5	4.5	0	Better with Prosthesis than without	
24	N Heel	-	0 Heel		0		2	-1	2	2	55	44	51	44	2.0	4.5	3.0	5.0		-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-

	End of Stump		except Tip of Stump		Proc. as if on Ankle or ft.															Normal	
								+⅛	o	o	-½	51, 59, 59	54, 55, 54	53, 56, 54	56, 53 48						
22		-		G		Stump Placed Higher		o	+½	-	-	-	-	-	-	2.5	5.0	2.5	5.5	0	-	-
23	E	-	-	-	-	-		+⅝	+¾	+⅜	-1	46, 48, 44	38, 38, 35	46, 45, 39	41, 37, 32	2.0	5.0	2.5	4.5	0	Better with Prosthesis than without	
24	N Heel	-	0 Heel		0			+½	-1	+½	+¼	55	44	51	44	2.0	4.5	3.0	5.0	0	-	-
25	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	E	X	0		0			+1⅛	-3/4	+1	-⅛	-	-	-	-	4	4.5	4.0	6.5	0	-	-
27	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	N Eye	-	-		With	0 Without		+1	+1	-1	+1⅛	53, 57, 51	42, 41, 41	53, 48, 50	38, 39, 41	2.0	3.0	3.0	4.5	0	-	-
29	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	N	/	0		0			-⅛	-⅛	+1	+1	45	42	36	40	1.5	4.5	2.0	5.0	0	-	-
31	N		0		0			o	o	+⅛	-3/4	-	-	-	-	-	-	-	-	0	-	-
32	N		0		0			+1	+1	+1	+1⅛	-	-	46, 42, 40½	53, 51, 50	2.0	4.0	2.5	4.0	0	-	-
33	N	-	0		0			-⅛	-⅛	-⅜	-⅛	47	43	46	38	-	-	-	-	0	No Significant Deviation	
34	N	-	0		0	10° below		-	-	-	-	64	51	66	55	2.5	5.0	-	-	0	-	-
35	N	-	0		0			o	+⅛	o	+⅛	-	-	-	-	2.0	4.5	2.5	5.5	0	Better with	Accuracy Exceeds Average Normal Considerably less in Precision
36	N	X	0 Knee and Ankle		0 After 3rd Trial			+1⅛	-⅛	+⅛	-⅜	43	41	41	40	2.0	3.0	2.5	4.0	0	-	
37	N	/	0	0 End of Stump	Knee Hyper-flexion of Right Hip			+1½	o	+1	o	-	-	-	-	2	2.5	3	3	0	-	-
38	N	-		0	0			+⅛	+⅛	o	+⅜	53	51	50	50	2.0	3.0	3.5	3.0	0	Better with	-
39	-	-	-	-	-	-		-	-	-	-	42	56	33	59	-	-	-	-	-	-	-
40	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	N	-		With Right Heel Poor	Knee & Hip Wearing Proc. Poor	0		+1⅛	-½	+¼	+¼	41	33	-	-	-	-	-	-	0	-	-
42		-	0		0			+⅛	o	+¼	o	48	56	41	48	3	4	2	4	-	No Significant Effect	-
43	N Slight Exception	-	0		0			+⅛	+⅛	+1	+⅛	39 37 35	40 39 38	38, 36, 36	36, 30, 32	6.5	4.5	6.0	5.5	-	-	-
44	N	X	0		0			+1	o	+⅜	+⅜	56	48	-	-	3	3	3	5	0	Less Variation	-
45	N	X		Heel or Knee	0			+⅛	o	+¼	o	38	38	34	34	2	5	2	3	0	No Deviation	
46	N	/	-	-	-			+⅛	o	+⅛	+¼	-	-	-	-	1	3	1	4	0	No Significant Deviation	
47	N	X	0		0			+1	+1	-½	o	59	47	54	48	-	-	-	-	0	No Significant Difference	
48	N Ear	X	0		0			+¼	-2	-⅜	o	56	46	56	49	2	2	6	7	0	-	-

KEY:

N NORMAL
A ABNORMAL
/ EFFECT PRESENT
X NO EFFECT PRESENT
- NO TEST GIVEN
0 AGREEMENT WITH COLUMN HEADING
o LEVEL
+ ABOVE LEVEL
- BELOW LEVEL

7.30 Data from Prediction Instruments and Techniques

Tables

Table 7.30-1

7.30-1 Wechsler-Bellevue Test Scores for Entire Population

Subject Case No.	Verbal I.Q.	Performance I.Q.	Full Scale I.Q.
I	105	103	102
II	103	114	109
III	126	135	133
IV	119	110	116
V	93	99	95
VI	130	122	127
VII	102	112	108
VIII	125	109	119
IX	101	97	100
X	110	109	110
XI	113	111	115
XII	115	127	122
XIII	120	110	117
XIV	129	117	124
XV	131	116	127
XVI	137	122	133
XVII	104	102	104
XVIII	120	106	116
XIX	103	91	96
XX	121	128	126
XXI	125	132	130
XXII	98	124	113
XXIII	99	96	97
XXIV	131	125	130

Wechsler-Bellevue Test Scores for Entire Population
(Concluded)

Subject Case No.	Verbal I.Q.	Performance I.Q.	Full Scale I.Q.
XXV	122	115	119
XXVI	124	114	120
XXVII	113	109	112
XXVIII	110	109	111
XXIX	110	104	108
XXX	110	98	104
XXXI	106	130	119
XXXII	127	135	133
XXXIII	125	117	124
XXXIV	114	113	116
XXXV	131	101	117
XXXVI	122	114	119
XXXVII	129	130	132
XXXVIII	120	121	123
XXXIX	96	109	103
XL	94	119	107
XLI	105	99	102
XLII	119	114	117
XLIII	97	93	96
XLIV	98	106	103
XLV	105	108	107
XLVI	118	110	117
XLVII	106	107	107
XLVIII	123	128	127

Table 7.50-2

7.50-2 Wechsler-Bellevue Sub-Test Scores for Entire Population

Subject Case No.	A Verbal I.Q.	B Perf. I.Q.	C Full Scale I.Q.
I	105	103	102
II	103	114	109
III	126	135	133
IV	119	110	116
V	93	99	95
VI	130	122	127
VII	102	112	108
VIII	125	109	119
IX	101	97	100
X	110	109	110
XI	113	111	115
XII	115	127	122
XIII	120	110	117
XIV	129	117	124
XV	131	116	127
XVI	137	122	133
XVII	104	102	104
XVIII	120	106	116
XIX	103	91	96
XX	121	128	126
XXI	125	132	130
XXII	96	124	113
XXIII	99	96	97
XXIV	131	125	130

Wechsler-Bellevue Sub-Test Scores for Entire Population
(Concluded)

Subject Case No.	A	B	C
XXV	122	115	119
XXVI	124	114	120
XXVII	115	109	112
XXVIII	110	109	111
XXIX	110	104	108
XXX	110	98	104
XXXI	106	130	119
XXXII	127	135	133
XXXIII	125	117	124
XXXIV	114	115	116
XXXV	151	101	117
XXXVI	122	114	119
XXXVII	129	150	152
XXXVIII	120	121	125
XXXIX	96	109	105
XL	94	119	107
XLI	105	99	102
XLII	119	114	117
XLIII	97	95	96
XLIV	98	106	105
XLV	105	108	107
XLVI	118	110	117
XLVII	106	107	107
XLVIII	123	128	127

Table 7.50-5

7.50-5 Bell Adjustment Inventory Scores for Entire Population

Subject Case No.	Home	Health	Social	Emotional	Occup.	Total
I	1	3	3	2	1	10
II	12	8	14	12	4	50
III	0	6	1	2	4	13
IV	1	5	16	12	5	39
V	4	8	22	17	9	60
VI	7	10	21	22	10	70
VII	1	3	13	0	2	19
VIII	10	3	0	4	4	21
IX	3	7	8	7	6	31
X	2	1	1	0	1	5
XI	0	7	1	1	17	26
XII	7	5	25	1	10	48
XIII	0	5	4	0	2	11
XIV	2	3	4	15	6	30
XV	2	5	2	3	6	18
XVI	2	4	2	4	9	21
XVII	1	1	9	6	2	19
XVIII	1	3	3	3	10	22
XIX	3	7	7	5	7	29
XX	3	5	12	10	10	40
XXI	9	10	3	5	1	28.
XXII	2	3	9	1	0	17
XXIII	3	11	6	7	3	30
XXIV	1	4	8	5	9	27

Bell Adjustment Inventory Scores for Entire Population (Concluded)

Subject Case No.	Home	Health	Social	Emotional	Occup.	Total
XXV	2	11	4	3	1	21
XXVI	7	13	2	13	0	35
XXVII	9	2	27	20	12	70
XXVIII	8	3	1	1	0	13
XXIX	1	5	23	1	8	38
XXX	10	7	6	12	7	42
XXXI	0	3	4	1	0	8
XXXII	8	5	10	8	11	42
XXXIII	15	6	13	19	4	57
XXXIV	3	6	15	4	12	40
XXXV	3	7	3	2	4	19
XXXVI	5	2	5	0	4	16
XXXVII	13	7	8	7	2	37
XXXVIII	0	4	4	2	3	13
XXXIX	2	7	13	3	9	34
XL	4	4	4	1	1	14
XLI	1	6	10	3	1	21
XLII	2	4	2	0	2	10
XLIII	13	6	21	7	5	52
XLIV	5	13	10	4	3	35
XLV	0	3	22	5	10	40
XLVI	2	8	4	1	4	19
XLVII	10	8	14	3	1	36
XLVIII	13	8	3	6	8	38

Table 7.50-4

7.50-4 Seitz-McFarlend P-S Experience Blank Scores for Entire Population

Subject Case No.	Part I	Part II	Total
I	24	76	100
II	20	51	71
III	161	185	346
IV	49	-7	42
V	20	4	24
VI	70	-57	13
VII	134	113	247
VIII	150	96	246
IX	101	128	229
X	156	109	265
XI	117	126	243
XII	156	167	323
XIII	153	134	287
XIV	141	149	290
XV	171	169	340
XVI	145	174	319
XVII	94	86	180
XVIII	142	115	257
XIX	95	133	228
XX	132	137	269
XXI	71	182	253
XXII	161	76	237
XXIII	14	39	53
XXIV	142	128	270

Seitz-McFarland P-S Experience Blank Scores for Entire Population (Concluded)

Subject Case No.	Part I	Part II	Total
XXV	88	185	273
XXVI	-26	-16	-42
XXVII	10	-44	-34
XXVIII	142	92	234
XXIX	140	134	274
XXX	94	79	173
XXXI	132	117	249
XXXII	133	165	298
XXXIII	100	72	172
XXXIV	131	135	266
XXXV	134	215	349
XXXVI	148	87	235
XXXVII	86	58	144
XXXVIII	140	124	264
XXXIX	136	112	248
XL	151	189	340
XLI	86	166	252
XLII	143	122	265
XLIII	37	122	159
XLIV	101	100	201
XLV	133	162	295
XLVI	125	153	278
XLVII	100	103	203
XLVIII	40	145	185

Table 7.30-5

7.30-5 Summary of Rorschach Test Scoring Factor Scores for Entire Population

CASE NO.	R	R.T." Ach.	R.T." Chr.	W	W%	D	D%	d	d%	Dd+S
I	19	18	16	8	42	11	58	0	0	0
II	21	14	12	4	20	17	80	0	0	0
III	17	17	10	7	40	10	60	0	0	0
IV	47	8	13	31	66	14	30	0	0	2
V	20	36	23	20	80	3	15	0	0	1
VI	55	18	11	15	27	38	68	0	0	2
VII	18	33	29	10	55	8	45	0	0	0
VIII	21	6	9	11	21	9	45	0	0	1
IX	53	15	11	10	19	37	71	3	5	3
X	11	103	173	5	45	4	36	1	9	0
XI	53	10	22	22	41	28	53	3	6	0
XII	55	18	11	15	27	38	68	0	0	2
XIII	16	30	38	5	31	8	50	3	19	0
XIV	46	15	22	24	52	19	41	2	4	1
XV	43	9	5	15	34	27	64	1	2	0
XVI	22	22	15	13	59	8	36	1	5	0
XVII	20	12	13	9	45	9	45	0	0	2
XVIII	15	20	12	5	20	11	73	0	0	1
XIX	22	45	74	4	18	17	77	0	0	1
XX	20	36	23	20	80	3	15	0	0	1
XXI	36	20	10	9	25	26	73	0	0	1
XXII	24	23	21	17	71	5	21	0	0	2
XXIII	23	13	20	4	17	18	78	1	5	0
XXIV	51	9	13	4	8	36	72	4	8	7

Summary of Rorschach Test Scoring Factor Scores for Entire Population (Concluded)

CASE NO.	R	R.T." Ach.	R.T." Chr.	W	W%	D	D%	d	d%	Dd+S
XXV	22	22	15	13	59	8	36	1	5	0
XXVI	50	11	10	20	40	27	52	3	7	0
XXVII	30	22	5	12	40	16	53	2	7	0
XXVIII	60	16	13	15	25	40	66	2	3	3
XXIX	14	16	33	5	36	8	57	0	0	1
XXX	46	9	9	6	13	35	76	5	11	0
XXXI	34	12	7	6	18	20	60	1	3	7
XXXII	16	29	16	7	44	8	50	0	0	1
XXXIII	33	6	8	5	15	22	66	3	9	2
XXXIV	24	16	11	10	41	14	59	0	0	0
XXXV	49	15	12	17	34	24	49	5	11	3
XXXVI	52	18	13	14	26	26	50	9	17	3
XXXVII	58	18	13	4	8	14	26	10	20	30
XXXVIII	23	13	20	4	17	18	78	1	5	0
XXXIX	20	40	41	5	25	15	75	0	0	0
XL	65	10	15	24	37	17	26	17	26	7
XLI	10	26	43	6	60	3	30	1	10	0
XLII	30	16	16	6	20	23	77	1	3	0
XLIII	22	20	33	7	31	15	69	0	0	0
XLIV	18	41	14	0	0	13	72	5	28	0
XLV	30	13	16	20	40	25	50	3	6	2
XLVI	42	23	23	23	60	17	40	0	0	0
XLVII	18	39	26	5	28	12	66	0	0	0
XLVIII	44	36	31	6	14	32	73	4	9	2

Table 7.30-6

7.30-6 Oyen-Bad Attitude Scale Scores for Entire Population

Case Number	Total Score	Item Scores											Item Scores											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
I	/12	-1	1	1	?	-1	0	1	1	0	0	1	0	0	1		-1	0	1	-1	I	2	2	1	0
II	-30	-2	-2	0	/2	-1	0	0	-1	-1	0	/2	/2	0	-2	0	-2	2	-1	-2	-2	-2	-2	0	-1
III	3	-1	-1	0	0	0	-1	0	1	0	1	1	2	0	1	0	1	0	-1	-1	0	0	0	-1	0
IV	-14	-1	0	0	/2	-1	0	/1	/1	0	/1	0	/1	0	0	0	-2	-1	/1	-1	/1	0	0	0	-1
V	-15	-2	-1	0	/2	0	0	0	-1	-1	/1	/1	-1	0	/1	0	-2	-2	-1	-1	/1	/1	/2	/1	0
VI	6	0	0	0	/2	-1	0	0	-1	0	/2	/1	/1	0	/2	0	-1	0	0	-2	0	/1	/1	/1	0
VII	5	0	-1	-1	/2	/1	0	/1	0	-1	/1	/2	/2	0	-1	-1	/1	-1	/1	/1	0	-1	/1	-1	0
VIII	- 8	-1	0	0	0	0	0	0	0	-1	0	/2	0	-1	-2	0	-1	0	-1	0	0	0	-0	0	0
IX	21	-1	-1	0	/2	/1	0	0	0	0	/2	/2	/2	/2	0	0	0	0	/1	-1	0	/2	/2	/2	/2
X	2	0	0	0	0	0	0	0	-1	0	0	/2	0	0	-1	-1	-2	0	0	0	0	0	0	0	0
[illegible]	[illegible]	/2	-1	0	/2	-2	0	0	0	-1	/2	/1	/2	0	/2	0	/1	-1	0	-1	0	-1	/2	/1	/2
XII	18	0	0	/1	/1	/1	0	0	0	0	/1	/2	/1	0	/1	/1	/1	0	/1	/1	0	0	/2	/1	0
XIII	9	-1	0	0	/1	/1	-1	0	0	0	/2	/2	/2	0	/1	0	/1	/1	0	-1	/2	/2	/2	-1	0
XIV	22	-1	0	0	/2	0	0	0	0	0	/2	/2	/2	0	/1	/2	/1	0	/1	/1	/1	/1	/2	0	0
XV	6	0	0	/1	/1	0	-1	0	0	0	/1	/2	/1	-1	/2	-1	0	0	/1	-1	0	0	/2	/2	0
XVI	12	-1	-1	0	/1	/1	0	0	/1	0	/1	/2	/2	0	/1	-1	/1	-1	/1	/1	/2	/2	/2	0	-1
XVII	- 1	-1	0	-1	0	0	0	0	0	0	/2	/1	/1	0	/2	-1	-1	-1	-2	-1	0	0	/1	-2	0
XVIII	12	0	0	0	/2	0	0	0	0	0	/1	/2	/1	0	/2	0	-1	-2	-2	/2	/2	/2	/2	/2	0
XIX	-15	-2	-1	0	/2	0	0	0	0	-1	/1	/1	/1	0	-1	-2	-2	-1	/1	/1	0	/1	/1	/1	0
XX	-29	-2	-2	/2	-1	/2	0	0	0	0	/2	/2	/2	0	-2	-2	-2	-1	-1	/2	-2	-2	0	-2	-2
XXI	-25	-2	-2	0	/1	/1	0	0	0	0	/1	/1	/1	0	-2	-1	-1	-1	/1	0	-1	/1	0	0	0
XXII	7	0	0	/2	0	0	0	0	0	0	0	/1	/1	0	/2	0	/1	-2	/1	-1	0	0	/1	/1	0
XXIII	15	-1	0	0	/2	/2	0	0	0	0	/2	/2	/2	0	-1	-1	/2	0	0	/1	/2	/2	/2	0	0
XXIV	-14	-2	-2	0	-2	0	-1	0	0	0	/1	/1	/1	-1	0	-2	/1	/1	/2	-1	/2	/1	-2	0	0
XXV	8	0	0	0	/2	-1	0	/2	0	0	0	/1	/2	-1	0	-1	/1	-1	/2	/1	/2	0	/2	0	0
XXVI	- 9	-2	0	0	/1	-2	0	0	-1	0	/1	/1	/1	0	0	-2	-1	-2	-1	-1	/1	/1	0	0	0
XXVII	- 7	-1	-1	0	/2	-1	0	0	0	0	/2	0	/1	0	/1	0	0	-2	-1	/2	0	0	0	-1	-1
XXVIII	- 4	0	0	0	/2	-1	0	0	0	0	/1	/2	/1	-1	0	0	/1	-2	0	-1	-1	-1	0	0	0
XXIX	- 4	0	0	0	0	0	0	0	0	-1	-2	-1	/1	0	0	-1	-1	0	-1	0	0	0	/1	/1	0
XXX	9	-2	/1	/1	/2	/1	0	/1	-1	-2	0	/2	/2	-1	/1	-1	-1	0	/1	-1	/1	/2	/1	/1	0
XXXI	15	0	0	0	/1	/1	0	0	0	-2	/2	/2	/1	0	/1	0	/1	-1	/1	/1	/2	/2	/2	/2	0
XXXII	5	-1	/1	0	0	0	0	/1	/1	-1	0	-1	-1	0	/1	0	-2	-2	-1	/1	0	/2	/1	/1	-1
XXXIII	8	-1	0	0	0	0	0	/1	0	0	/1	/1	/1	0	0	0	0	0	/2	/2	0	/1	/1	/1	0
XXXIV	35	0	0	0	/2	/1	-1	0	0	/1	0	/1	/1	/2	/2	0	/1	/2	/2	/2	/2	/2	0	0	0
XXXV	0	-1	-1	0	/2	0	0	0	-1	0	/1	/1	/2	0	/1	0	-1	-2	-1	-2	0	/2	/2	/2	0
XXXVI	10	-2	0	0	/2	/2	0	0	0	0	0	-2	/1	-2	/2	0	-2	0	/2	/2	0	0	/2	/2	0
XXXVII	23	0	/2	/1	/2	/2	0	0	0	0	/1	/2	/2	-1	/2	/1	0	-1	0	/2	/1	/2	/1	-1	0
XXXVIII	-15	0	0	/2	/1	-1	0	0	0	0	-1	0	0	-2	/1	0	-2	-2	-1	-1	/1	/1	-2	-2	0
XXXIX	-16	0	/1	/1	/2	0	0	0	0	0	0	-2	/2	-1	/1	-1	-2	-2	-2	-2	0	0	/1	-1	0
XL	-24	-2	-1	/1	0	0	0	0	0	/1	0	-2	0	-2	/1	0	-2	-1	-1	-2	-1	0	/2	/2	0
XLI	11	0	0	0	/1	/1	0	0	-2	-1	/2	/1	/2	0	/1	0	/1	/1	-1	-2	0	0	/2	/2	0
XLII	12	0	0	0	/1	/1	0	0	/2	0	0	/1	/1	0	/1	0	/2	-1	/1	/1	/2	/2	/2	/1	/2
XLIII	22	-1	-2	0	/2	/2	0	0	0	0	/2	/1	/2	0	0	-2	/1	0	/1	-2	/2	/2	/2	/2	0
XLIV	- 3	0	-2	0	/2	/2	0	0	0	0	/2	/2	/1	0	/2	0	-1	0	-1	-1	0	/1	/1	/2	0
XLV	-11	0	/1	-2	/2	/1	-2	0	0	-2	/2	/1	0	-1	/2	0	-1	-1	-1	-2	-1	/1	/1	-2	0
XLVI	26	-1	0	0	/2	0	0	0	0	0	/2	/2	/1	0	/1	0	/2	/2	0	/2	0	0	/2	/2	0
XLVII	32	/2	/2	0	0	0	0	0	0	-2	/1	/2	/2	0	/2	0	/2	/1	/2	-1	/2	/2	0	/2	0
XLVIII	1	-2	-2	/2	0	0	0	0	0	/2	/1	[illegible]	/2	0	/1	0	0	-1	/1	-1	0	0	0	0	0

Item Scores

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
2	2	1	0	-1	1	-2	-2	0	0	-2	0	-1	0	2	0	1	0	1	-2	1	1	1	0	0	0	0	1	0	1
-2	-2	0	-1	-1	/1	0	-1	0	0	0	/1	0	-2	-1	0	0	-1	-2	-1	-2	-1	/1	-1	0	-2	0	0	0	-1
0	0	-1	0	0	-1	0	0	0	0	0	0	-2	0	1	0	0	0	1	-1	1	0	1	0	0	0	0	0	1	1
0	0	0	-1	-2	-1	0	2	-1	-1	-1	-2	-1	-1	/1	-1	-1	0	/1	-2	-2	/1	/1	0	0	0	-1	0	0	0
/1	/2	/1	0	-1	-2	-1	0	0	0	0	-1	-1	-1	0	0	-1	/1	0	-2	-2	/1	/1	-1	-1	-1	-1	0	0	-2
/1	/1	/1	0	-2	/2	0	-2	0	/2	0	0	0	0	/1	0	0	0	0	-2	/1	0	0	0	-1	0	0	/1	0	0
-1	/1	-1	0	-1	-1	-2	-1	0	-1	0	0	-1	0	0	0	/2	/2	/1	-2	/1	/1	/1	0	0	0	0	0	0	/1
0	0	0	0	-1	-1	0	/2	0	0	0	0	0	-1	-1	0	0	0	/1	-1	-1	-1	/1	0	-1	0	0	0	0	0
/2	/2	/2	/2	0	0	0	-1	0	0	/1	0	-1	/1	-1	/1	/1	/1	0	0	/1	/1	/1	-2	-1	0	0	/1	0	.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	/2	/2	0	/1	/1	-1	0	0	0	0	0	0	0
-1	/2	/1	/2	0	0	0	0	0	0	0	-2	0	-1	0	0	/1	0	/2	-1	/1	0	0	-1	-1	-2	0	/1	0	/2
0	/2	/1	0	/1	0	0	0	0	0	0	/1	/2	0	0	0	/1	0	/1	-2	-1	0	0	0	0	0	0	0	0	0
/2	/2	-1	0	0	-1	0	0	0	0	0	0	0	-1	0	0	0	/1	/1	0	-1	0	0	-1	-1	0	/1	0	0	/1
/1	/2	0	0	0	/1	0	-1	0	0	/1	0	0	0	0	0	0	0	/1	0	/1	0	/1	0	0	0	0	0	0	/1
0	/2	/2	0	-2	-2	-1	/2	0	0	0	0	/2	-2	/2	0	0	/1	/2	-1	/2	0	-2	-2	-1	-1	-1	/1	0	0
/2	/2	0	-1	/1	-1	-1	0	0	0	0	0	0	0	0	-1	0	0	/1	0	/1	0	/1	0	-1	0	-2	/1	0	0
0	/1	-2	0	/1	-1	-1	0	0	-1	-1	0	0	0	0	0	0	/1	/1	0	/1	/1	0	0	0	0	0	/1	0	0
/2	/2	/2	0	-1	/1	0	-1	0	-1	0	0	-1	-1	-1	0	/1	0	/1	0	/1	0	/1	0	0	0	0	0	0	0
/1	/1	/1	0	-1	-1	-1	0	-1	0	-1	-2	-1	-1	-1	-1	0	0	/2	-1	/1	/1	0	-2	-2	0	-1	-1	-1	/1
-2	0	-2	-2	-2	-1	-1	0	-1	-1	-1	-2	-1	-1	-2	0	0	/1	-2	-2	/1	/2	0	-2	-2	-2	0	0	0	-1
/1	0	0	0	-2	-2	0	-2	-2	-2	0	0	-2	-2	-2	0	0	0	0	-2	-2	0	/1	-1	-1	0	0	0	-1	0
0	/1	/1	0	0	/1	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	/1	/2	0	-2	0	0	0	0	0	0
/2	/2	0	0	/1	0	0	0	0	-2	0	-1	0	0	0	0	0	0	0	-2	/1	/2	/1	0	-1	0	0	0	0	0
/1	-2	0	0	0	-2	-2	-2	-2	-1	-2	-2	-1	-2	0	0	/2	/2	0	-2	0	0	0	-1	0	0	0	0	0	/2
0	/2	0	0	0	-1	0	0	0	0	0	-1	-1	-2	/1	0	0	0	-1	/1	/1	/2	0	-1	-1	-1	0	/1	0	0
/1	0	0	0	-2	-2	-2	/2	0	-1	0	0	0	0	/2	0	0	0	/2	-1	/1	/2	0	-1	-2	-1	0	/1	0	-1
0	0	-1	-1	-1	/1	-2	-2	-1	-1	-2	0	-2	0	/1	0	/1	0	/2	-2	0	-1	/1	0	0	0	0	/1	-1	/1
-1	0	0	0	0	0	-1	-2	0	0	0	0	-2	0	/1	0	0	0	/1	-1	/1	0	-1	-1	0	0	0	/1	0	0
0	/1	/1	0	-1	0	0	0	-1	-1	-1	0	0	0	0	0	0	0	/1	0	-1	/1	/1	-1	-1	/1	0	0	/1	/1
/2	/1	/1	0	0	-1	-1	/2	0	0	0	0	-1	-2	-1	0	0	/1	/2	-1	/1	/2	/1	-1	-1	-1	/1	0	0	/2
/2	/2	/2	0	-1	/1	0	-2	0	0	0	0	-1	-1	/1	0	0	0	0	0	/1	/1	/1	0	-1	0	0	0	0	0
/2	/1	/1	-1	-2	/1	-1	0	0	0	-1	0	0	-2	/1	only 35 questions answered														
/1	/1	/1	0	0	0	0	0	0	0	0	0	0	0	-2	0	/1	0	-1	-1	/1	0	/1	-1	0	-1	/1	/1	0	-1
/2	0	0	0	/1	0	0	/2	0	/2	0	0	/2	0	0	0	0	/2	0	0	/2	/2	/2	0	0	0	0	/1	0	0
/2	/2	/2	0	-1	0	-2	0	0	0	0	/1	/2	-1	0	0	0	0	-1	-2	-1	/1	/1	0	-1	-1	0	/1	0	0
0	/2	/2	0	0	0	0	/1	0	0	0	0	-1	0	-1	0	0	0	0	0	0	0	/2	/2	0	0	0	0	0	0
/2	/1	-1	0	-1	/1	-1	-2	-1	0	/1	/2	-2	-2	/2	-1	/2	/2	/2	-2	/1	/2	/2	-1	0	-2	-1	/1	0	/2
/1	-2	-2	0	/1	-1	-1	-1	0	-1	0	-1	0	/1	0	0	0	/1	-1	-2	-1	0	/1	0	-2	-2	/1	/1	0	0
0	/1	-1	0	/1	0	0	-2	0	-1	-1	-1	-1	-2	/1	-1	/1	/1	-2	-2	/1	0	0	-1	-2	0	0	-1	0	/1
0	/2	/2	0	-2	/1	-2	-2	-1	0	-2	-2	0	-2	-2	-2	-1	0	/2	-1	0	/1	/2	0	-1	0	-1	-2	0	0
0	/2	/2	0	/1	/1	0	-2	0	0	0	0	-1	0	-1	0	0	/2	/2	-2	0	0	0	0	-1	/1	0	/1	0	/2
/2	/2	/1	/2	/2	0	0	-2	0	0	0	-1	-2	-1	/1	0	-1	0	0	0	-1	0	0	0	-1	0	-1	0	0	0
/2	/2	/2	0	/2	0	0	/2	0	0	0	0	/2	0	0	0	-1	0	/2	0	/2	0	/2	-1	0	-1	0	/1	0	0
/1	/1	/2	0	-2	/1	-1	-2	0	-1	-2	0	0	-1	0	0	0	-1	0	-2	-1	/1	0	0	0	-2	0	0	0	0
/1	/1	-2	0	0	-1	0	-2	/1	0	0	0	-2	-2	0	0	/2	0	0	-1	/1	-2	-1	0	0	-1	0	/1	0	0
0	/2	/2	0	0	/2	0	0	0	/1	0	0	-1	-1	/1	0	0	/2	0	0	/2	0	/1	0	0	0	0	/2	0	0
/2	0	/2	0	/2	-1	0	0	0	0	0	0	/2	-1	0	0	/2	/2	/2	0	/2	/2	0	0	0	0	0	/2	0	0
0	0	0	0	/1	/2	0	-2	-2	-2	0	-2	0	0	0	0	-1	0	0	0	/1	0	/1	0	/1	0	0	0	0	0

Table 7.30-7

7.30-7 Biographical Information Blank Scores for Entire Population

		Poor Walkers	Good Walkers
Mech.	Interest	8	7
	Ability	9	8
Introvert		5	7
Extrovert		9	6
Eco. Status	High	7	5
	Low	7	8
Change in Hobby		12	10
Reading	Some	12	11
	Less	2	2
Change in Religious Habit	Then	14	11
	Now	8	7

Table 7.30-8

7.30-8 Guided Clinical Interview Scores for Entire Population

Case Number	1.0 Attitudes Toward Family		2.0 Attitudes Toward People In General		3.0 Attitudes Toward Sex		4.0 Attitudes Toward Self		5.0 Attitudes Toward Injury	
	+	-	+	-	+	-	+	-	+	-
I	16	5	7	6	9	0	7	0	3	2
II	8	12	9	4	4	4	2	4	7	2
III	4	0	17	0	0	0	10	0	12	0
IV	11	1	10	1	7	0	7	1	11	0
V	15	4	3	8	4	6	2	6	1	4
VI	9	9	3	7	2	5	3	4	6	2
VII	15	1	16	0	6	0	2	6	1	4
VIII	20	0	6	3	5	0	6	2	7	0
IX	16	3	6	4	1	3	4	4	5	1
X	11	4	8	0	12	0	9	0	11	0
XI	1	9	1	12	3	0	2	6	2	4
XII	17	1	12	2	4	0	11	0	9	0

Guided Clinical Interview Scores for Entire Population (Continued)

Case Number	Attitudes Toward Family		Attitudes Toward People In General		Attitudes Toward Sex		Attitudes Toward Self		Attitudes Toward Injury	
	+	-	+	-	+	-	+	-	+	-
XIII	24	0	18	0	10	0	8	0	8	0
XIV	10	5	14	2	12	0	8	0	9	0
XV	9	0	10	2	10	0	5	0	7	1
XVI	11	1	14	2	12	0	9	0	12	0
XVII	4	0	7	4	1	0	2	1	6	0
XVIII	17	4	10	2	6	6	7	0	6	0
XIX	15	4	10	1	4	1	10	0	11	0
XX	17	3	12	3	4	5	8	0	12	0
XXI	20	2	11	6	9	0	12	0	10	0
XXII	3	1	0	14	6	2	3	2	2	7
XXIII	22	4	17	0	12	0	12	0	12	0
XXIV	7	8	6	2	4	2	6	3	9	0
XXV	12	5	10	2	12	0	6	1	12	0
XXVI	11	3	9	1	1	2	1	1	1	2
XXVII	15	4	5	8	2	3	3	5	3	0

Guided Clinical Interview Scores for Entire Population (Continued)

Case Number	Attitudes Toward Family		Attitudes Toward People In General		Attitudes Toward Sex		Attitudes Toward Self		Attitudes Toward Injury	
	+	-	+	-	+	-	+	-	+	-
XXVIII	14	4	3	5	9	0	4	1	4	2
XXIX	10	3	5	6	12	0	5	0	5	2
XXX	13	4	9	2	4	6	4	2	7	0
XXXI	6	0	18	0	11	0	10	0	9	0
XXXII	15	4	16	0	11	0	7	0	11	0
XXXIII	15	6	9	2	5	1	6	4	12	0
XXXIV	9	8	1	12	10	0	2	5	2	8
XXXV	2	13	5	7	5	4	4	4	9	1
XXXVI	16	1	14	1	12	1	10	0	11	0
XXXVII	4	10	4	7	1	3	1	3	4	2
XXXVIII	5	3	15	0	11	0	5	1	11	0
XXXIX	12	3	10	2	12	0	11	0	8	0
XL	7	7	3	6	6	6	3	5	8	2
XLI	2	0	14	0	9	0	8	0	8	0

Guided Clinical Interview Scores for Entire Population (Concluded)

Case Number	Attitudes Toward Family		Attitudes Toward People In General		Attitudes Toward Sex		Attitudes Toward Self		Attitudes Toward Injury	
	+	-	+	-	+	-	+	-	+	-
XLII	19	4	15	0	12	0	12	0	11	0
XLIII	5	3	1	6	3	1	7	0	6	0
XLIV	15	2	13	0	11	0	6	1	10	0
XLV	25	2	9	1	5	0	11	0	9	0
XLVI	9	1	1	4	8	0	4	2	2	2
XLVII	19	0	10	0	6	1	4	3	5	3
XLVIII	18	0	10	3	0	1	6	1	1	0

7.40 Data from Criterion Instruments and Techniques

Tables

Table 7.40-1

7.40-1 Judges' Ratings of Gait for Entire Population

Case Number	Judge A Rating	Judge A Z Score	Judge B Rating	Judge B Z Score	Judge C Rating	Judge C Z Score	Composite Rating Total Z Score	Composite Rating Rank
I	- 8	- .79	- 4	- .22	-8	-1.2	-2.21	37 - 38
II	- 8	- .79	- 4	- .22	-8	-1.2	-2.21	37 - 38
III	- 8	- .79	- 3	∤ .22	-9	-1.7	-2.27	39
IV	-10	-1.6	- 5	- .67	-7	- .75	-3.02	42
V	- 7	- .40	- 2	∤ .67	-6	- .28	-0.01	21 - 22
VI	- 4	∤ .79	- 3	∤ .22	-4	∤ .66	∤1.67	13 - 14
VII	- 9	-1.10	- 6	-1.1	-4	∤ .66	-1.54	34
VIII	- 8	- .79	- 4	- .22	-5	∤ .19	-0.82	30
IX	-12	-2.4	- 4	- .22	-8	-1.2	-3.82	45
X	- 7	- .40	-10	-2.9	-7	- .75	-4.05	46
XI	- 2	∤1.6	- 0	∤1.6	-2	∤1.6	∤4.80	2
XII	- 2	∤1.6	- 1	∤1.1	-2	∤1.6	∤4.30	4
XIII	-10	-1.6	-10	-2.9	-8	-1.2	-5.70	48
XIV	- 8	- .79	- 2	∤ .67	-7	- .75	-0.87	31
XV	- 6	0	- 2	∤ .67	-5	∤ .19	∤0.86	15

Judges' Ratings of Gait for Entire Population (Continued)

Case Number	Judge A Rating	Judge A Z Score	Judge B Rating	Judge B Z Score	Judge C Rating	Judge C Z Score	Composite Rating Total Z Score	Composite Rating Rank
XVI	- 7	- .40	- 3	∕ .22	-4	∕ .66	∕0.48	19
XVII	- 6	0	- 3	∕ .22	-5	∕ .19	∕0.41	20
XVIII	- 8	- .79	- 4	- .22	-9	-1.7	-2.71	41
XIX	- 7	- .40	- 6	-1.1	-8	-1.2	-2.70	40
XX	- 7	- .40	- 3	∕ .22	-6	- .28	-0.46	27
XXI	- 6	0	- 3	∕ .22	-6	- .28	-0.06	24 - 25
XXII	- 6	0	- 4	- .22	-6	- .28	-0.50	29
XXIII	- 6	0	- 4	- .22	-5	∕ .19	-0.03	23
XXIV	-10	-1.6	- 4	- .22	-9	-1.7	-3.52	44
XXV	- 4	∕ .79	- 2	∕ .67	-7	- .75	∕0.71	18
XXVI	- 1	∕2.0	- 1	∕1.1	-2	∕1.6	∕4.70	3
XXVII	- 7	- .40	- 5	- .67	-7	- .75	-1.82	36
XXVIII	- 1	∕2.0	0	∕1.6	-1	∕2.1	∕5.70	1
XXIX	- 4	∕ .79	- 5	- .67	-4	∕ .66	∕0.78	17
XXX	- 7	- .40	- 2	∕ .67	-7	- .75	-0.48	28
XXXI	- 8	- .79	- 7	-1.6	-7	- .75	-3.14	43
XXXII	- 4	∕ .79	- 3	∕ .22	-4	∕ .66	∕1.67	13 - 14

Judges' Ratings of Gait for Entire Population (Concluded)

Case Number	Judge A Rating	Judge A Z Score	Judge B Rating	Judge B Z Score	Judge C Rating	Judge C Z Score	Composite Rating Total Z Score	Composite Rating Rank
XXXIII	- 6	0	- 3	∠ .22	-6	- .28	-0.06	24 - 25
XXXIV	- 3	∠1.1	- 2	∠ .67	-3	∠1.1	∠2.87	8 - 9
XXXV	- 3	∠1.1	- 1	∠1.1	-2	∠1.6	∠3.80	5 - 6
XXXVI	- 3	∠1.1	0	∠1.6	-3	∠1.1	∠3.80	5 - 6
XXXVII	- 3	∠1.1	- 2	∠ .67	-3	∠1.1	∠2.87	8 - 9
XXXVIII	- 9	-1.1	- 2	∠ .67	-5	∠ .19	-0.24	26
XXXIX	- 9	-1.1	- 8	-2.0	-8	-1.2	-4.30	47
XL	- 3	∠1.1	- 3	∠ .22	-3	∠1.1	∠2.42	11
XLI	- 5	∠ .40	- 3	∠ .22	-5	∠ .19	∠0.81	16
XLII	- 2	∠1.6	- 2	∠ .67	-4	∠ .66	∠3.03	7
XLIII	- 5	∠ .40	- 1	∠1.1	-4	∠ .66	∠2.16	12
XLIV	- 6	0	- 5	-	-4	∠ .66	-0.01	21 - 22
XLV	- 4	∠ .79	- 2	∠ .67	-3	∠1.1	∠2.56	10
XLVI	- 7	- .40	- 6	-1.1	-6	- .28	-1.78	35
XLVII	- 6	0	- 6	-1.1	-5	∠ .19	-0.91	32
XLVIII	- 8	- .79	- 3	∠ .22	-7	- .75	-1.32	33

Table 7.40-2

7.40-2 Amputation Questionnaire Item Scores for Entire Population

Case Number	Score	Case Number	Score	Case Number	Score
I	11	XVII	31	XXXIII	18
II	15	XVIII	2	XXXIV	26
III	3	XIX	24	XXXV	19
IV	10	XX	25	XXXVI	12
V	12	XXI	25	XXXVII	27
VI	17	XXII	19	XXXVIII	25
VII	26	XXIII	24	XXXIX	12
VIII	18	XXIV	22	XL	29
IX	28	XXV	28	XLI	20
X	0	XXVI	15	XLII	24
XI	21	XXVII	16	XLIII	10
XII	3	XXVIII	23	XLIV	16
XIII	7	XXIX	27	XLV	15
XIV	27	XXX	21	XLVI	27
XV	20	XXXI	16	XLVII	19
XVI	2	XXXII	21	XLVIII	6

TABLE 7.40-3

VOCATIONAL RATING REPORT SCORES

FOR THIRTY SUBJECTS

SUBJECTS	A	B	C	D	E	F	G	H	I	J	K
I	5	7	7	7	5	7	7	7	7	8	67
II	4	6	6	3	5	4	3	4	3	2	40
IV	9	10	8	9	9	9	9	10	9	7	89
V	4	2	5	4	5	4	4	5	4	6	43
VI	5	5	5	6	5	7	5	7	6	10	61
VII	4	5	5	5	5	5	5	5	5	10	54
VIII	6	6	8	4	6	5	4	5	4	6	54
IX	7	5	5	4	9	6	4	6	6	10	62
XI	1	5	5	7	5	5	5	5	3	10	51
XII	8	8	6	6	10	6	6	8	8	10	76
XIII	7	8	8	9	10	9	9	10	7	10	87
XV	9	10	9	8	9	8	7	9	9	10	88
XVIII	0	10	10	7	6	5	5	5	5	6	59
XIX	5	4	7	5	5	6	5	5	5	6	53
XXI	8	7	6	6	7	7	6	7	5	8	67
XXIII	5	5	7	5	5	5	5	5	5	6	55
XXV	7	7	5	4	6	5	5	6	6	6	57
XXVII	7	4	5	1	3	3	2	4	2	3	34
XXVIII	3	7	5	7	8	6	6	7	7	8	64
XXX	9	9	7	9	5	6	7	7	7	10	76
XXXII	7	7	6	7	7	7	6	6	6	8	67
XXXIII	4	8	6	6	8	4	6	8	8	10	68
XXXIV	3	5	3	5	5	5	5	5	1	3	40
XXXVI	1	5	5	5	5	5	5	5	5	4	45
XXXVIII	3	5	5	3	5	4	4	4	4	4	38
XLI	8	8	9	7	7	6	7	7	7	10	76
XLIII	8	9	6	9	10	9	8	10	9	8	86
XLIV	4	5	5	5	5	5	5	5	5	8	52
XLV	6	8	6	6	6	6	6	7	8	10	69
XLVIII	5	5	6	5	6	6	5	6	4	8	56

KEY:

A EMOTIONAL STABILITY
B SELF-CONFIDENCE
C FRIENDLINESS
D PERSONAL FITNESS
E QUALITY OF WORK
F QUANTITY OF WORK
G COMPARISON WITH OTHERS
H EVIDENCE OF GROWTH
I POSSIBILITY FOR FUTURE GROWTH
J GENERAL QUESTIONS
K TOTAL SCORE

Table 7.40-4

7.40-4 Achievement Test Scores for Entire Population

Case Number	Score	Case Number	Score	Case Number	Score
I	40	XVII	39	XXXIII	41
II	37	XVIII	39	XXXIV	46
III	42	XIX	44	XXXV	44
IV	46	XX	44	XXXVI	39
V	43	XXI	9	XXXVII	43
VI	47	XXII	37	XXXVIII	45
VII	36	XXIII	42	XXXIX	38
VIII	39	XXIV	40	XL	49
IX	38	XXV	44	XLI	38
X	3	XXVI	47	XLII	45
XI	44	XXVII	25	XLIII	42
XII	43	XXVIII	47	XLIV	36
XIII	39	XXIX	41	XLV	41
XIV	41	XXX	40	XLVI	34
XV	39	XXXI	41	XLVII	43
XVI	39	XXXII	41	XLVIII	42

7.50 Data from Studies Relating Prediction and Criterion Data

Tables

TABLE 7.60-1

INTERCORRELATIONS OF PREDICTION AND CRITERION DATA

FOR FORTY-EIGHT SUBJECTS

Variable	2	3	4	5	6	7
Criteria:						
1. Gait	.200	.280	.069	.068	.051	-.048
2. Amputation Questionnaire		.201	-.104	-.042	.070	-.056
3. Achievement Test			-.007	.116	.254	-.181
Predictors:						
4. Wechsler-Bellevue				-.061	.288*	-.067
5. Bell Adjustment Inventory (Negative Scale)					-.574**	-.625**
6. Seitz-McFarland P-S Scale						.540**
7. Attitude Scale						

* Significant at the 5% level using Fisher's test for significance of r

** Significant at the 1% level using Fisher's test for significance of r

TABLE 7.50-2

INTERCORRELATIONS OF PREDICTION AND CRITERION DATA

FOR THIRTY SUBJECTS

Variable	2	3	4	5	6	7	8
Criteria:							
1. Gait	.118	.224	-.038	.187	.064	.278	.181
2. Amputation Questionnaire		-.099	-.272	-.066	-.185	.151	.021
3. Achievement Test			.058	-.142	-.022	.544**	-.006
4. Vocational Rating				.077	-.136	.265	.358
Predictors:							
5. Wechsler-Bellevue					-.017	.332	.045
6. Bell Adjustment Inventory (negative Scale)						-.591**	-.750**
7. Seitz-McFarland P-S Scale							.570**
8. Attitude Scale							

** Significant at the 1% level using Fisher's test for the significance of r

TABLE 7.50-3

PERCENTAGES OF THIRTEEN "GOOD" AND FIFTEEN "POOR" USERS OF PROSTHESES SHOWING CLINICAL INTERVIEW ITEMS

(NEUTRAL CASES EXCLUDED)

	TOTAL		✓		-			TOTAL		✓		-	
ITEM	✓	-	GOOD	POOR	GOOD	POOR	ITEM	✓	-	GOOD	POOR	GOOD	POOR
1.11	39.3	25.0	46.2	33.3	30.8	20.0	3.2	71.4	7.1	76.9	66.7	7.7	6.7
1.12	60.7	3.6	61.5	60.0	7.7	-	3.3	64.3	7.1	84.6	46.7	-	13.3
1.13	60.7	7.1	53.8	66.7	15.4	-	3.4	60.7	17.9	69.2	53.3	7.7	26.7
1.14	64.3	10.7	61.5	66.7	15.4	6.7	3.5	67.9	10.7	76.9	60.0	7.7	13.3
1.15	60.7	10.7	38.5	80.0	15.4	6.7	3.6	75.0	14.3	84.6	66.7	7.7	20.0
1.16	25.0	35.7	23.1	26.7	38.5	33.3	4.1	75.0	3.6	69.2	80.0	7.7	-
1.17	46.4	21.4	38.5	53.3	23.1	20.0	4.2	60.7	28.6	61.5	60.0	30.8	26.7
1.18	53.6	3.6	46.2	60.0	-	6.7	4.3	32.1	28.6	38.5	26.7	30.8	26.7
1.21	64.3	3.6	46.2	80.0	-	6.7	4.4	85.7	3.6	76.9	93.3	7.7	-
1.22	42.9	21.4	38.5	46.7	38.5	6.7	4.5	32.1	32.1	30.8	33.3	30.8	33.3
1.23	10.7	42.9	7.7	13.3	46.2	40.0	4.6	53.6	7.1	46.2	60.0	-	13.3
1.31	64.3	3.6	53.8	73.3	7.7	-	5.1	57.1	14.3	53.8	60.0	15.4	13.3
1.32	17.9	35.7	23.1	13.3	38.5	33.3	5.2	42.9	32.1	53.8	33.3	38.5	26.7
1.33	53.6	25.0	53.8	53.3	38.5	13.3	5.3	57.1	10.7	61.5	53.3	15.4	6.7
1.34	78.6	10.7	69.2	86.7	15.4	6.7	5.4	89.3	-	92.3	86.7	-	-
2.1	28.6	42.9	30.8	26.7	46.2	40.0	5.5	71.4	10.7	76.9	66.7	15.4	6.7
2.2	39.3	42.9	38.5	40.0	38.5	46.7	5.6	78.6	-	69.2	86.7	-	-
2.3	42.9	39.3	46.2	40.0	38.5	40.0	6.1	64.3	7.1	61.5	66.7	7.7	6.7
2.4	75.0	14.3	69.2	80.0	23.1	6.7	6.2	60.7	28.6	53.8	66.7	38.5	20.0
2.5	75.0	7.1	61.5	86.7	15.4	-	6.3	57.1	25.0	61.5	53.3	23.1	26.7
2.6	64.3	10.7	53.8	73.3	7.7	13.3	6.4	53.6	17.9	46.2	60.0	30.8	6.7
2.7	46.4	28.6	46.2	46.7	38.5	20.0	6.5	71.4	-	69.2	73.3	-	-
2.8	78.6	14.3	76.9	80.0	23.1	6.7	6.6	75.0	-	76.9	73.3	-	-
2.9	57.1	21.4	69.2	46.7	15.4	26.7	6.7	60.7	17.9	69.2	53.3	23.1	13.3
3.1	60.7	10.7	76.9	46.7	7.7	13.3	6.8	32.1	39.3	30.8	33.3	38.5	40.0

TABLE 7.50-4

BIOGRAPHICAL INFORMATION BLANK IN RELATION TO GAIT AND AMPUTATION QUESTIONNAIRE CRITERION ITEMS

	HAVE		HAVE NOT	
	GOOD	POOR	GOOD	POOR
Mechanical Interest	54*	60	46	40
Mechanical Ability	62	67	38	33
Introversion	46	67	54	33
High Economic Status	38	47	62	53
Change in Hobby	85	86	15	14
Reading Habits	85	80	15	20
Religious Habits - Then	77	93	23	7
Religious Habits - Now	54	53	46	47
Differences with Family	0	87	100	13
Differences with Friends	0	87	100	13
Health	77	67	23	33

* All numbers are in terms of percent

7.60 Data from Special Quantitative and Qualitative Studies

Tables

Table 7.61-1

7.61-1 Analysis of Judges' Ratings of Criterion Group of "Efficient" Prosthetic Users

Case Number	Percentile Range in Which Subject's Score is Found in Judge A's Distribution.	Percentile Range in Which Subject's Score is Found in Judge B's Distribution.	Percentile Range in Which Subject's Score is Found in Judge C's Distribution.
XXVIII	95.8 - 99.9+	93.7 - 99.9+	97.9 - 99.9+
XI	89.6 - 95.7	93.7 - 99.9+	89.6 - 97.8
XXVI	95.8 - 99.9+	85.4 - 93.6	89.6 - 97.8
XII	89.6 - 95.7	85.4 - 93.6	89.6 - 97.8
XXXV	79.2 - 89.5	85.4 - 93.6	89.6 - 97.8
XXXVI	79.2 - 89.5	93.7 - 99.9+	79.2 - 89.5
XLII	89.6 - 95.7	64.6 - 85.3	62.5 - 79.1
XXXIV	79.2 - 89.5	64.6 - 85.3	79.2 - 89.5
XXXVII	79.2 - 89.5	64.6 - 85.3	79.2 - 89.5
XLV	68.7 - 79.1	64.6 - 85.3	79.2 - 89.5
XL	79.2 - 89.5	50. - 64.5	79.2 - 89.5
XLIII	64.6 - 68.6	85.4 - 93.7	62.5 - 79.1

Table 7.61-2

7.61-2 Analysis of Judges' Ratings of Criterion Group of "Inefficient" Prosthetic Users

Case Number	Percentile Range in Which Subject's Score is Found in Judge A's Distribution.	Percentile Range in Which Subject's Score is Found in Judge B's Distribution.	Percentile Range in Which Subject's Score is Found in Judge C's Distribution.
II	14.6 - 31.1	25.0 - 49.9	6.2 - 18.6
I	14.6 - 31.1	25.0 - 49.9	6.2 - 18.6
III	14.6 - 31.1	50.0 - 64.5	0 - 6.1
XIX	31.2 - 47.8	8.3 - 16.8	6.2 - 18.6
XVIII	14.6 - 31.1	25.0 - 49.9	0 - 6.1
IV	2.1 - 8.2	16.9 - 24.9	18.7 - 35.3
XXXI	14.6 - 31.1	6.2 - 8.2	18.7 - 35.3
XXIV	2.1 - 8.2	25.0 - 49.9	0 - 6.1
IX	0 - 2.0	25.0 - 49.9	6.2 - 18.6
X	31.2 - 47.8	0 - 4.1	18.7 - 35.3
XXXII	8.3 - 14.5	4.2 - 6.1	6.2 - 18.6
XIII	2.1 - 8.2	0 - 4.1	6.2 - 35.3

Table 7.61-3

7.61-3 Comparison of Wechsler-Bellevue Test Scores of 25 Per Cent "Most Efficient" and 25 Per Cent "Least Efficient" Prosthetic Users

	Verbal	Performance	Full Scale
Mean of Highest	114.4	112.8	114.9
Mean of Lowest	111.7	103.3	112.6
Difference	2.7	9.5	2.3
t Score	.57	1.83	.58
Pt Score	59.7%	8.4%	59.7%

Table 7.61-4

7.61-4 Comparison of Wechsler-Bellevue Sub-Test Scores of 25 Per Cent Highest and 25 Per Cent Lowest Prosthetic Efficiency Ratings

	Information	Comprehension	Digit Span	Arithmetic	Similarities	Picture Arrangement	Block Design	Object Assembly	Digit Symbol	Picture Completion
Mean of Most Efficient	12.4	12.8	9.7	12.2	11.8	11.3	11.5	12.3	12.0	12.8
Mean of Least Efficient	12.5	14.0	9.9	10.3	12.5	11.0	11.4	11.4	11.6	11.0
Difference	0.1	1.2	0.2	1.9	0.7	0.3	0.4	0.9	0.4	0.5
t-score	.12	1.11	.15	1.9	.65	.27	.42	.87	.49	.60
Pt	90%	28%	88%	7.5%	52%	79%	68%	39%	63%	56%

Table 7.61-5

7.61-5 Comparison of Efficiency Ratings of Highest Scoring and Lowest Scoring on the Bell Adjustment Inventory

	Home	Health	Social	Emotional	Occupa-tional	Total Score
Highest	/.13	/.02	/.01	-.03	/.25	/.28
Lowest	-.36	-.06	/.24	/.21	/.11	-.06
Difference	.49	.08	.23	.24	.14	.34
t Score	1.48	.72	.70	1.35	1.12	.89
Pt Score	15.9%	48.2%	49.4%	6.5%	27.7%	38.5%

Table 7.61-6

7.61-6 A Comparison of the Means of Various Rorschach Test Components of the "Efficient" Group with Rorschach Test Key Criteria of Optimal Normal Performance

Rorschach Factor	Key Criteria	Efficient Prosthetic Group Means
R	20 - 40	47.3
W%	20 - 30	30.9
D%	45 - 55	53.7
d%	5 - 15	8.3
S%	Less than 10%	8.0
M	2 - 4	3
F%	50%	36.3
F+%	70 - 80	92.9
FC	1 - 3	4.3
CF	0 - 1	3.3
A%	30 - 55	35.5
P	5	5.4

Table 7.61-7

7.61-7 A Comparison of the Means of Various Rorschach Test Components of the "Inefficient" Group with Rorschach Test Key Criteria of Optimal Normal Performance

Rorschach Factor	Key Criteria	Inefficient Prosthetic Group Means
R	20 - 40	27
W%	20 - 30	29.3
D%	45 - 55	61.8
d%	5 - 15	3.7
S%	Less than 10%	1
M	2 - 4	2.5
F%	50%	46.9
F/%	70 - 80	85.3
FC	1 - 3	1.3
CF	0 - 1	1.3
A%	30 - 55	52.7
P	5	4.3

Table 7.61-8

7.61-8 A Comparison of the Means of Various Rorschach Test Components of the "Efficient" and "Inefficient" Groups

Rorschach Factor	Mean of Efficient Group	Mean of Inefficient Group	Difference	t-Score	Pt-Score
R R	47.3	27.2	20.1	3.3	1%
R/T Ach.	15.0	36.9	21.9	2.67	1.5%
R/T Chr.	16.4	34.2	17.8	2.34	3.2%
W	14.5	7.7	6.8	2.38	2.9%
W%	30.9	29.3	1.6	.29	78%
D	24.2	16.7	7.5	1.92	7%
D%	53.7	61.8	8.1	1.25	23%
d	4.4	1.0	3.4	1.59	13%
d%	8.3	3.7	4.6	1.53	15%
Dd/S	4.2	1.8	2.4	.96	35%
Dd/S%	6.9	4.6	2.3	.61	55%
Refusals	0	.92	.92	2.88	1%
VIII-X					
R	34.8	41.7	6.9	1.77	9.5%
F%	36.3	46.9	10.6	1.68	11%
F/%	92.9	85.3	7.6	1.38	19%
A%	35.5	52.7	17.2	2.39	2.9%
S	0	.67	.67	1.84	8.0%
P	5.4	4.3	1.1	1.93	7%

Table 7.61-9

7.61-9 Comparison of Munroe Inspection Test Scores of 25 Per Cent "Most Efficient" and 25 Per Cent "Least Efficient" Prosthetic Users

25 Per Cent Most Efficient		25 Per Cent Least Efficient	
Case Number	Munroe Inspection Rorschach Score	Case Number	Munroe Inspection Rorschach Score
XXVIII	14	II	8
XI	12	I	12
XXVI	14	III	7
XII	13	XIX	7
XXXV	12	XVIII	14
XXXVI	14	IV	8
XLII	6	XXXI	6
XXXIV	14	XXIV	15
XXXVII	10	IX	9
XLV	13	X	17
XL	15	XXXIX	9
XLII	7	XIII	9
MEAN	12	MEAN	10.08
S.D.	2.8	S.D.	3.4

A Comparison of the Means of Various Rorschach Test Components of the "Efficient" and "Inefficient" Groups (Concluded)

Rorschach Factor	Mean of Efficient Group	Mean of Inefficient Group	Difference	t-Score	Pt-Score
0	.42	.33	.09	.41	69%
F	17.2	13.5	3.7	1.12	28%
F-	.42	1.1	.68	1.74	9.5%
M	3.0	2.4	.6	.50	62%
M-	.08	.17	.09	.60	56%
FM	8.2	5.6	2.6	1.73	10%
Fm	1.08	.50	.58	1.25	23%
FK	1.3	.17	1.13	4.52	1%
KF	.58	0	.58	2.52	1.96%
K	0	.17	.17	1.00	33%
Fk	1.8	.58	1.22	8.71	1%
Fc	4.4	2.3	2.1	2.92	1%
cF	1.3	0	1.3	2.28	3.5%
FC	4.3	1.3	3.0	3.95	1%
CF	3.3	1.3	2.0	2.78	1.2%
C	0	0	0	-	-
FC'	.08	.25	.17	.94	36%
C'F	0	.08	.08	1.00	33%

Chapter VIII

8.0 DISCUSSION OF RESULTS

8.10 The Experimental Population

The records of the New York Regional Office of the Veterans Administration indicate that there are approximately 800 above-the-knee amputee veterans in the Metropolitan New York Area. Our sample of forty-eight subjects represents, therefore, approximately 6 per cent of the total population. However, in studying the quality of the sample, we obtained detailed information on another group of forty-eight above-the-knee amputee veterans. Our data with respect to the characteristics of the sample population represent about 12 per cent of the total above-the-knee amputee veterans, and we have reason to believe that the findings and conclusions which emerge from our research have applicability to the larger group of leg amputees in the Metropolitan New York Area.

At an early stage of the inquiry, a decision to work exclusively with veterans was reached because of our belief that at least a few of the enormous number of variables which we had to account for in a study of the kind projected could be handled if we dealt exclusively with the amputee population from World War II. Considerable experience has given sanction to our original decision, and although we believe that the findings of our study apply, within limits, to non-veteran amputees, it is essential to point out that, strictly speaking, the conclusions and recommendations are applicable only to amputee veterans.

In helping to define the status of our sample population, we have found the neurological examinations and sensory exploration studies unusually helpful; and we are especially grateful to Dr. Morris Bender and his associates in our College of Medicine who cooperated so unselfishly with us on this part of the study. In view of the fact that each subject had lost his limb as a result of some kind of distinctly traumatic experience connected with combat service, during which he might have sustained serious damage to his central and peripheral nervous systems, it appeared to us to be quite essential to obtain information as to the subject's neurological status.

Of special interest to us has been the phantom limb phenomenon which is of wide occurrence among both arm and leg amputees. Two principal theories as to the origins of such phenomena are rather widely held. The first theory, which may be characterized as peripheral, makes the experience of phantom sensations referable to some kind of peripheral stimulation of the nerve endings in the stump. Such stimulation is usually variously attributed to the formation of a neuroma or to some pattern of excitation which is traceable to chemical or mechanical agents. The other theoretical approach, which is a central theory, assumes that phantom limb sensations are referable to some kind of psychogenic stimulation of largely central origin. The data collected on our forty subjects are not especially helpful in permitting us to arrive at an opinion as to which of the two theories may be the more tenable, and indeed there is no need for us to commit ourselves to either view.

Indeed, we find it useful to assume that both peripheral and central factors may be playing a role in the experiences of phantom sensations reported by our thirty-seven subjects. The evidence which emerges from the special studies undertaken, however, suggests rather strongly that central factors are probably more important in the neurogenesis and psychogenesis of phantom sensations than purely peripheral factors. It is also useful for us to assume that each amputee adopts a special attitude toward his lost limb, and that the majority of our subjects are apparently able to achieve at least a superficial acceptance of the loss of their limbs. The data collected in this present study, as well as information reported in the literature, suggest that phantom limb phenomena are exceptionally common, and may indeed occur in all leg amputees who are studied sufficiently thoroughly to ascertain their existence. In point of fact, there is nothing strange or unusual about such experiences which have at least the sanction of common occurrence in virtually every case of amputation. We may even suggest, in this connection, that phantom limb sensations undoubtedly play a central role in helping the amputee make an over-all adjustment to his disability; and in dealing with amputees, one is justified in pointing out the constructive function of such sensations. A number of recent studies suggest, for instance, that phantom sensations are likely to occur especially in the extremities, and particularly in the distal portions thereof, where there is presumably the highest degree of readiness for such impressions, although phantom experiences are also common in any portions of the body which project into space. For this reason, among perhaps others, the distal part of the phantom sensation may be the last to disappear, a situation which may be

held accountable for the illusion, which so many amputees experience, that the phantom limb is becoming progressively shorter.

Evidence suggests that phantom pain, as distinct from phantom sensations alone, may be considerably less common; and its occurrence may very well be a function, as some investigators have suggested, of the presence of psychopathology in the amputee.

8.20 The Prediction Instruments

In the design of the study, we chose those personality appraisal instruments which previous research in the area of the physically handicapped had suggested might show some promise. Although non-projective personality inventories had been rather widely employed in the relatively few investigations in this area, they had shown little promise in differentiating the physically handicapped from the non-handicapped. It, therefore, became desirable to employ a number of projective tests and methods, among which have been the Rorschach Test, the Thematic Apperception Test, the Draw Two Men and a Woman and Tell a Story Test, and the Open-End Attitude Scale, which is a kind of incomplete sentences technique. Although, in principle, we felt more strongly committed to the projective methods, we felt it wise to employ the standardized personality inventories as well. Hence the basis for our decision to use the Bell Adjustment Inventory, Adult Form, and the Seitz-McFarland P-S Experience Blank. The latter, it is interesting to note, toward the end of an extensive as well as intensive assessment program in the Office of Strategic Services during World War II, had been found to be generally useful; and we believe that it is not surprising that in our own inquiry the value of this instrument has been again demonstrated.

Because of the many assessment procedures we have used in this study, it should be useful to look at each of them relatively closely from the vantage point of the completed study.

(a) The Biographical Information Blank as a method for collecting relevant personal and social history data has proved useful, and we see no need to improve it except in the direction of making it more complete and searching.

(b) The Amputation Questionnaire, which is another instrument for collecting facts about the amputee, especially in relation to his experiences in connection with the loss of his limb, the fitting of a prosthesis, training in the use of the artificial limb, and experience in adjusting to the prosthetic device, has shown itself as a device which, while it can be improved, is adequate to our needs. It is interesting, in this connection, to point out that the same instrument has been employed in an extensive questionnaire study of several hundred leg amputees with good results.

(c) The Wechsler-Bellevue Test of Adult Intelligence is certainly the best instrument available for assessing adult intelligence, both verbal and performance. We are of the opinion that since, in principle, general intelligence is a factor which should be relevant to any inquiry in this area, there is ample justification for the use of the Wechsler-Bellevue. That we have been unable to establish any stable relationships between intelligence as measured by this instrument and differential performance among our amputees as assessed by our several criterion techniques is surprising but not unreasonably so. We feel justified, indeed, in suggesting that this matter be in-

vestigated further with great care; and we are persuaded that there may indeed be real, although as yet undiscovered, relationships between performance intelligence and ability to walk well with a prosthesis.

(d) The Bell Adjustment Inventory is a widely known and extensively used instrument for the assessment of personality. As a non-projective device, it aims at an evaluation of personality on the level of personality characteristics of which the subject has some awareness and insight. Our findings suggest that this personality inventory has a proper place in any battery of tests which are to be used for the purpose of assessing the personality of above-the-knee amputees, and it is our feeling that the five areas in which the inventory is scored should provide helpful information, if used clinically and as the basis for an interview, for an understanding of the subject.

(e) The Seitz-McFarland P-S Experience Blank is another non-projective personality inventory which appears useful as an assessment device in work with leg amputees. Because of the fact that this instrument yields scores of both a physiological and psychological nature, we feel that it is to be preferred in studies with amputees to the Bell Adjustment Inventory. We are of the opinion, however, that it too needs to be used clinically and that it may prove very rewarding in assessment to utilize it as the basis for an intensive clinical interview.

(f) The Open-End Attitude Scale, which is essentially an incomplete sentences techniques, certainly deserves a place in the assessment battery but only after it has had the benefit of careful revision. Consisting of fifty items, our attitude scale appears too heavily weighted with purely personal items, which have as their distinguishing mark the use of the personal pronoun "I" in structuring the stimulus situation. Experience with this blank has led to our conviction that more items of a projective sort, in which the first name of someone or a personal pronoun in the third person is employed, should be included in this instrument.

In general, this conclusion is congruent with the experience of H.A. Murray and his co-workers in their use of the incomplete sentences technique in the OSS during the recent war. Projective items apparently would permit us to uncover considerably more significant information about the subject than the present blank, which consists essentially of personal items, makes possible.

(g) The Guided Clinical Interview, despite its difficulties of interpretation, in the hands of a skilled clinical psychologist, impresses us as perhaps the soundest and more fruitful assessment procedure available at the present time in the investigation of personality among above-the-knee amputees.

In the course of our use of the Guided Clinical Interview, we found ourselves faced with a formidible task in the reduction of the qualitative data to some sort of quantitative form which would be meaningful and which could be related to our several criterion measures. The system of scoring which was finally adopted evidently has con-

siderable merits, but we would not argue that to some extent at least it does not permit us to do full justice to the essential richness of clinical data. At the present time, we see no way out of this basic and inherent difficulty which every clinician faces if he is to use material from clinical interviews.

The structure of the clinical interview, of course, is essential to keep in mind in any inquiry such as that attempted here. In the development of our clinical interviewing techniques, we sought to arrive at a happy blend of the directive and non-directive elements which are present in every clinical interview. However, because we were primarily interested in eliciting certain classes of information to the relative neglect of other kinds of data, our interviews on the whole became somewhat more directive than at first seemed desirable. On the whole, it was this situation, which we had deliberately contrived, which constituted the essential grounds on which Miss C. Etta Walsh based her criticism of the interviewing technique in her master's thesis, "Examination of a Psychological Study of the Influence of Personality Factors in Adaptability to Prostheses: A Critical Analysis of Seven Clinical Interviews." For a thorough and searching analysis of the function of the Guided Clinical Interview in our study, the interested reader is referred to this report.

(h) The Rorschach Psychodiagnostic Test, not only on the basis of our use of it in our battery but also because of its successful utilization by Randall, Ewalt, and Blair (76), merits inclusion in any assessment battery to be employed in further research in this area. To our knowledge, the cited work is the only other study

which has employed the Rorschach Test in investigations of the personalities of amputees. Despite this limited use, we are of the persuasion that the instrument has a peculiar usefulness in inquiries in the field of physical handicap which require extensive exploration. Even in the absence of any background of knowledge which may be used to interpret the records, we have found a place for the Rorschach Test in our assessment battery.

Certain problems, such as the meaning of frequent somatic references and the amount of anxiety present in the protocols, require very careful investigation before the full usefulness of the Rorschach Test can be made available to research workers in this area.

(i) The Modified Thematic Apperception Test, although we have not had time to evaluate its function as a member of the assessment battery, has, we feel, real contributions to make to inquiries in this field.

(j) The Draw Two Men and a Woman and Tell a Story, which is another projective procedure which we have been unable to evaluate in the time available to us, also offers, in our judgment, unusual possibilities for investigating the changes in body image which may occur as a consequence of amputation.

Summary

Although upon original consideration the assessment battery may appear to utilize the "buck shot" approach to the study of the personalities of our subjects, our experience with the several procedures has given sanction to our original belief that the instruments chosen for investigation are sound and, for the most part, have a place in

any serious attempt at personality assessment of above-the-knee amputees.

In routine study of amputees within a hospital or amputee center setting, our assessment procedures are obviously too numerous and time consuming. Any modifications of the assessment battery for objectives which are more limited in scope than those which characterize the present inquiry may be made along lines which square with our findings.

8.30 The Criterion Instruments and Techniques

The nature of our criteria has caused perhaps more difficulty in this research than we had at first expected. From the very beginning, in the design of the study we sought to develop a set of criteria which would be as objective and stable as possible, and to which we could relate our personality findings with some security in the belief that our criteria were valid and reliable. We have ended up with criteria which, we feel, fall far short of what we sought. Despite this situation, we have to accept the fact that our present criteria are the best which could have been used within the framework of the present inquiry.

It should prove helpful to look at each criterion carefully from the vantage point of the completed inquiry.

(a) The Ratings of Gait, which we had planned as our most objective measure, turned out to be considerably less satisfactory than had been intended. On the whole, the procedure for taking movies of our subjects walking has proven to be a sound one; and it is difficult to discover any changes in method, to the advantage of the research project, which could have been instituted in this area. However, difficulties immediately arose in connection with the problem of evaluating gait by a panel of experts. As is evident from the data reported above, only two of the judges showed any marked amount of consistency in making evaluations. As a matter of fact, the ratings of the third judge departed so greatly from those of the other judges that it became essential to eliminate the former set of ratings. The fact that two of the three judges tended to

make the same or quite similar evaluations actually provides small comfort and offers no security at all with respect to the character of the data which emerged.

As a matter of fact, there is some evidence which suggests that our set of ratings is contaminated to some degree in that personal factors, such as the prestige and professional competence of the raters whose evaluations were used, intruded themselves into the process of judging. In principle, it is possible to eliminate such sources of contamination; in practice, it can rarely be achieved.

(b) The Achievement Test impresses us as a good and useful criterion measure, but for reasons over which we had little control at a certain stage of the investigation, it became necessary to employ only one rater. We feel reasonably certain that if it had been possible for us to obtain performance ratings on our subjects which were made by a minimum of three raters, the Achievement Test would have emerged as a better criterion instrument.

As it stands, the Achievement Test measures the limits of performance of the subject with his artificial limb, and as such, it is a good index of the quality as well as the extent of performance abilities of the above-the-knee amputee. The principal weakness of the instrument lies, as is usual, in its use so that the effectiveness of the criterion measure is determined chiefly by the skill of the persons who use it.

(c) The Vocational Rating Report as a procedure for obtaining an evaluation of the performance by the subject and his adjustment to his job situation requires extensive revision if it is to

be developed into a fruitful criterion measure. As it stands, it has all of the merits and defects of similar vocational rating blanks on which it is based.

Before we would want to use it in any further inquiries, we feel that it should be thoroughly revised, and that it be accomplished in each case by the subject's employer only if a staff psychologist is present to aid him in this process.

(d) The Amputation Questionnaire Items which we had felt were distinctly of a criterion nature and should be employed as one of the criterion measures have not proved to be useful in this manner. The items are of two sorts -- factual and opinion -- and we feel that they should have a place among the criteria, despite the fact that our experience with them has given little sanction for this belief. In further inquiries in this area, we feel that this matter should be thoroughly investigated.

Summary

Our four criterion measures leave much to be desired. As a result of our research, however, we feel that all of them, with certain modifications, should be retained for use in additional inquiries within the framework of the present study, or in inquiries which are similar to it.

Our plan to combine the several criterion measures into a composite criterion did not work out because of certain statistical issues and problems which could not be resolved. We are more firmly convinced than ever, though, that a single criterion measure, developed from measures similar to those employed in this project, is essential for progress in this area.

Before much progress can be made in an inquiry of the kind represented by this research, the difficult problem of suitable criterion measures of established validity and reliability must be solved. Until this is done, it is evident that little further progress can be expected.

8.40 Relationships Between Prediction and Criterion Instruments

The only statistically significant correlation between a prediction instrument and a criterion measure is that which exists between the Seitz-McFarland P-S Experience Blank and the Achievement Test. Our data show that the Achievement Test is a relatively independent criterion measure, and it appears that there is a stable relationship between the way in which an above-the-knee amputee thinks about himself, as revealed by the P-S Experience Blank, and what he is able to do with his artificial limb, as measured by the Achievement Test.

This is by no means a surprising finding, reflecting as it does the well established psychological principle that the self-concept of the individual is related to differences in performance in a wide variety of tasks. In one sense, this portion of the study may be said to have further validated this well established principle. In another sense, the research may be considered to have shown that it is possible to predict performance, even the complex kind of performance represented by the achievement tasks, by means of a personality inventory.

It is significant, we think, that the amputee's gait appears to be affected by his attitudes toward sex. This is not established directly by the data although it represents, we feel, a reasonable interpretation of some of the qualitative findings. We cannot be sure of the exact meaning of this apparent relationship, but it may be that, as some have suggested, that it is related to the possible activation of castration fears, presumably long dormant, by the traumatic insult of amputation. That it occurs among so many of

our above-the-knee amputees is hardly surprising, for there is abundant evidence, in the vernacular, of the references made to the loss of a lower extremity in relation to a threat to the external male genitalia.

Using the Cronbach Technique Modification, we found no significant relationships between prediction instruments and criterion data. However, the value of these instruments for clinical prediction by psychologists was substantiated. The Clinical Interview appeared to be the most useful prediction instrument; the Attitude Scale next; and the Biographical Information Blank the least useful. The technique does not readily lend itself to an analysis of the specific role of each instrument, since the personality data furnished by each instrument are blended into composite statements which are used for prediction purposes. A study of the role of each instrument could easily be instituted, using the same design but eliminating the other two instruments, while only one is tested at a time. In this way, the number of correct predictions made could be used as a kind of index of the degree of relationships.

No attempt was made to establish any relationships between the data obtained from each instrument and the criteria in this study. Since what the clinician uses in practice are judgments he makes about the data he has accumulated. This portion of study therefore concerned itself only with establishing the relationship between these judgments and the criteria.

8.50 Miscellaneous General Findings

It is a fortunate finding that the Rorschach Test actually does differentiate between the "good" and the "poor" walkers. This, it seems to us, is especially significant in view of the fact that we have necessarily had to interpret the Rorschach Test largely from our experience with non-amputee subjects. It is entirely conceivable that if scoring and interpretation standards were available for amputees -- as well they may eventually be -- our capacity to differentiate the two criterion groups might thereby be considerably sharpened.

As it is, the Rorschach has again demonstrated its usefulness in another personality inquiry.

Some professional workers have long entertained the idea that the length of the stump in relation to the height of an above-the-knee amputee affects to a marked degree the quality of his gait. In general, our findings support this observation, although they suggest that it is apparently only one among many important factors.

Our data are also certainly suggestive of the desirability of fitting the amputee with a prosthesis as soon after amputation as he can physically accommodate it. To fail to do so, at least among our subjects, may increase his difficulty in subsequent walking on his artificial limb.

8.60 Miscellaneous Special Findings

The Rorschach Test is extremely useful in providing us with fairly specific information about the personality characteristics of the "more efficient" users of artificial limbs among our subjects.

If, as our data show, such personality factors as intellectual productivity, greater energy and affective adaptability, and greater capacity for insight into their own needs characterize the twelve subjects judged "best walkers", we have a basis for understanding and appreciating how certain natural or acquired personal qualities may affect adjustment to and use of an artificial limb. This is an issue requiring thorough study, but we feel we are traveling in the right direction in our interpretation of the meaning of the differences in personality as revealed by the Rorschach Test.

The Cronbach Technique, as modified for our study, furnishes an interesting and informative test of our prediction materials. We have not been able to predict more than one-third of our statements correctly, but we have received insights into the factors that make for an understanding of the adjustment an amputee has made to his prosthesis. Apparently the nature and character of a man's reaction to the loss of his limb whether or not it is perceived as a major change in his self-concept, whether it can be simply treated as an accident that could not have been prevented, whether there is underlying security and self-assurance to accept the injury, whether the injury has emphasized basic dependency needs, or whether the amputee's motivation and super-ego cause him to perform well on the job, or whether he uses his amputation as a convenient crutch to

avoid responsibilities, whether there was sufficient extroversion and adequate social-relationship as well as the nature of the man's sexual life--apparently determine, to a large extent, how the amputee will react to his injury and adjust to his prosthesis. This has been but a preliminary study, and we hope to have better criteria in the future to use within the framework of this validation design to isolate more adequately the specific factors influencing prosthetic adjustment as viewed by the psychologist.

8.70 Implications for Further Research

Much time, effort, and money have been invested, especially in recent years, in the development of better prosthetic devices. The criteria for evaluating improvement in these devices have usually been of an abstract nature, largely in terms of the laws of physics or the principles of engineering. To a large extent, the design and construction of prosthetic devices have been guided by considerations of body type and physical characteristics of the wearer. In virtually no instance of which we have any knowledge has the personality of the individual who is to wear the artificial limb been given serious consideration.

The design and development of prostheses are currently reaching a high degree of refinement and efficiency in terms of basic engineering principles. Despite this situation, it is common knowledge that when a superbly engineered prosthesis has been fitted to a particular individual, the results have often been disappointing. In many instances, indeed, the amputee is only slightly more efficient in his gait and in his general adjustment to the physical and social environments with the new device than he was with a previous artificial limb which did not embody recent engineering advances.

This study is useful in suggesting that one reason for this disparity between the evaluation of a particular prosthetic device and the evaluation of a particular individual's use of that device may well lie in the personality of the amputee himself. The dynamics of the individual, as well as those of the device, appear to be relevant in the design, fitting, and instruction in use of the prosthesis.

The implication is clear. Future research should address itself not only to the question of mechanical efficiency of the device itself, but also to the type of device which is necessary for efficient utilization by a particular amputee. Much practical experience offers sanction to this research implication. It may well be, for example, that prostheses should be constructed not only with the physical dimensions of the amputee in mind but also with his personality characteristics clearly in view. In its broadest implication, the study suggests that the efficiency with which an individual can use a machine depends not alone on the design characteristics of the machine, but also upon the personality structure of the individual who is charged with working with it.

Other implications are evident. What, for instance, are the possibilities of using in other clinical psychological inquiries an assessment battery similar to that employed here to study the problem of prediction, which is the core of every science? What classes of stable and broad criteria may be employed in researches of this kind? These, and many other questions, grow quite naturally out of the findings of this exploratory study, which represents, at best, only one small and halting step forward along the long road of understanding the behavior of human beings.

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* Studies related to the present one which may be profitably consulted in connection with interpreting the data presented.

APPENDIX A

A - 1. Biographical Information Blank

A - 2. Amputation Questionnaire

A - 3. Wechsler-Bellevue Test Blank I and II

A - 4. Bell Adjustment Inventory

A - 5. Seitz-McFarland Psychosomatic Inventory

A - 6 Rorschach Test Forms

A - 7 Open-End Attitude Scale

A - 8 Thematic Apperception Test Modifications

A - 9 Draw Two Men and a Woman and Tell a Story Test

RESEARCH DIVISION
COLLEGE OF ENGINEERING
NEW YORK UNIVERSITY

BIOGRAPHICAL INFORMATION BLANK

1. Name_____ Address_____

2. Birth date_____ Height _____ Weight _____

EDUCATIONAL HISTORY

3. Name of school and city	Course	No. of years attended	Highest grade completed
a.			
b.			
c.			
d.			

4. I was_____ years old when I started school, and_____years old when I left.

5. I left school because_____

_____

6. My best subject was_____ My worst subject was _____

7. I was a: (check one)

_____superior student _____average student _____ poor student

8. List all extra-curricular activities you engaged in (clubs, sports, school paper, etc.).

a._____

b._____

c._____

EMPLOYMENT HISTORY

9. List last job first

a. Dates of employment: (month, year)

From_____ to _____

Title of job_____

_____

Salary $ _____ per_____

Description of your work_____

_____

_____

_____

_____

_____

Employer's name & address_____

_____

_____

b. Dates of employment:

From _____ to_____

Title of job_____

_____

Salary $_____per_____

Description of your work_____

_____

_____

_____

_____

_____

Employer's name & address_____

_____

_____

c. Dates of employment:

From_____ to_____

Title of job_____

_____

Salary $_____per_____

Description of your work_____

_____

_____

_____

_____

Employer's name & address_____

_____

_____

_____

d. Dates of employment:

From _____ to_____

Title of job_____

_____

Salary $_____ per_____

Description of your work_____

_____

_____

_____

_____

Employer's name & address_____

_____

_____

_____

10. Which job did you like best?_____

Which job did you like least?_____

11. What kind of work would you prefer to do?_____

_____

12. What special training or skills do you have? (operate short-wave radio, comptometer, turret lathe, typewriter, etc.)_____

_____

13. After my amputation I had to change my kind of work. _____ yes _____ no.

My former line of work was_____

My present line of work is_____

SOCIAL HISTORY

14. List all clubs, fraternities and organizations in which you are or were a member.

Name and type of organization	How long a member?	Like it?	Did you hold any office?
a.			
b.			
c.			
d.			

15. Do you attend meetings or functions regularly?_____ If yes, how often?

_____

16. My favorite amusements before amputation were:

a._____ b._____ c._____

17. My favorite amusements since amputation are:

a._____ b._____ c._____

18. My favorite hobbies before amputation were:

a._____ b._____ c._____

19. My favorite hobbies since amputation are:

a._____ b._____ c._____

20. Check as many of the following which apply:

_____I am married. _____I am engaged. _____I am divorced.

_____I am separated. _____I have a girl friend.

_____I have many girl friends. _____I have no girl friends.

21. If married, how many children do you have?_____

22. I have the following number of close male friends.

_____many _____several _____one _____none.

23. What newspapers do you read regularly?_____

24. What magazines do you read regularly?_____

25. What books have you read recently? _____

_____

26. As a child I attended church.

_____ regularly_____ occasionally _____ rarely _____never.

27. As an adult I attend church.

_____ regularly_____occasionally _____ rarely_____never.

28. What is your religion?_____

29. As a child, my family was_____

_____ wealthy_____average _____ poor.

30. At the present time I have

_____ substantial savings_____moderate savings _____ no savings.

31. At the present time I have an income which is

_____excellent_____ adequate_____insufficient.

FAMILY HISTORY

32. My family consists of:

	Name	Age	Married	Occupation	Highest school grade completed
Father					
Mother					
Brothers and Sisters					
Wife (if any)					
Children					

33. How did you get along with your family as a child?_____

_____

_____

34. What difficulties did you have with your family after your amputation?_____

_____

_____

_____

35. Are these difficulties still going on?_____

_____

_____

36. What do you believe caused them?_____

_____

_____

37. Do you feel that you are still causing your family trouble?_____

_____

_____

38. Are you satisfied with your family's attitude towards you? ___ yes____ no.

Why not?_____

_____

_____

39. Did you have any difficulties with your friends after amputation?_____

_____

_____

40. Are these difficulties still going on?_____

_____

_____

41. What do you believe causes them?_____

_____

_____

42. Are you satisfied with your friend's attitude towards you? ___ yes____ no.

Why not?_____

MEDICAL HISTORY

43. What is your general health now?_____

List all the serious illnesses or disabilities that you have had except amputation.

_____

_____

44. Do you have any other illness or disability at present?_____

_____

_____

45. Are you presently under medical care?_____ yes_____ no. They are treating me for

_____

Research Division
College of Engineering
New York University

AMPUTATION QUESTIONNAIRE

NAME_____

HOME ADDRESS_____ BUSINESS ADDRESS_____

_____ _____

HOME PHONE_____ BUSINESS PHONE_____

PART I

PLACE A CHECK MARK IN FRONT OF THE MOST NEARLY CORRECT ANSWER WHERE INDICATED

1. What do you think of the limb you are presently wearing?

____excellent_____good_____fair_____poor_____very poor.

2. How does it feel while walking?

____very comfortable ____comfortable _____fair ____somewhat uncomfortable

____very uncomfortable.

3. It feels uncomfortable because_____

_____

_____

_____

_____

_____

4. I can't use this leg properly because_____

_____

_____

_____

_____

_____

5. How far can you walk on your leg comfortably?_____

_____

_____

6. I have pain when I_____

_____

_____

7. Is there anything wrong with your artificial leg? ____ yes ____ no.

What is it?_____

8. They could improve my artificial leg by_____

9. They could improve my walk on this leg by_____

10. Why do other amputees get <u>better</u> use out of their leg than you do?

11. Why do other amputees get <u>poorer</u> use out of their leg than you do?

12. What kind of an artificial leg would you like to have?

13. My suggestions on the proper use of an artificial limb are

14. Do you think that you use your artificial leg well? _____ yes _____ no.

15. How do you think that you could improve in this use of your leg?

16. What important things are you prevented from doing because of your artificial leg?

17. What kind of leg amputation do you have?

_____above the knee

a)_____upper third

b)_____middle third

c)_____lower third

d)_____at knee

_____below the knee

18. What is the length of your stump? _____inches.

19. Do you have a well-formed stump?

_____very well formed _____well formed _____satisfactorily formed

_____poorly formed _____very poorly formed.

20. Briefly describe your stump._____

_____

_____

_____

_____

_____

21. Does your stump give pain?

_____unbearable _____considerable _____some _____little _____none.

When?_____

_____

_____

_____

_____

22. The date of my amputation was_____

23. My first artificial leg was fitted _____weeks after the amputation.

24. It took me_____ months to learn to use an artificial leg.

25. I know how to use my leg correctly_____ yes_____ no.

Because_____

_____

_____

_____

_____

26. The thing that is wrong with artificial legs is_____

_____

_____

_____

_____

_____

27. The leg handicaps me in my work. _____ yes _____ no.

In what way?_____

_____

_____

28. Because of my amputation, I had to change my kind of work. _____ yes _____ no.

29. My former line of work was (before amputation)_____

_____

30. My present line of work is_____

_____

_____

_____

_____

PART 2

1. What is your weight?_____ lbs. How old are you?_____ years.
   What is your height? _____ feet _____ inches.
   What is the weight of your artificial leg?_____ lbs.

2. What type of artificial leg do you have?_____

_____

3. Do you have a step regulator or control device (friction) in your knee?
   _____ yes _____ no. What type?_____

_____

   Do you use it? _____ Why?_____

4. Who is the manufacturer of the leg? _____

_____

5. How long does your artificial leg last you? _____ Months.

6. For each part of the artificial leg listed below, indicate what problems you have met while using your leg, and what suggestions you have for improving each of the parts. (Tell us your experiences with each part of the leg.)

   a) Pelvic Belt (hip control) (i.e., tears, irritations, confort, repairs, etc.)

_____

_____

_____

   b) Pelvic Band (i.e., weight, irritations, rivet failure, breakages, etc.)

_____

_____

_____

   c) Pelvic Joint (i.e., noise, alignment, maintenance, attachment to socket, etc.)

_____

_____

_____

d) Socket (i.e., irritation, alignment, etc.)

Type_____end bearing

_____above-knee_____

_____

_____

e) Knee joint (i.e., maintenance difficulties in use, buckling (how and when), how often serviced, etc.)

Type_____friction knee

_____free motion_____

_____

_____

f) Shin (side braces) _____

_____

_____

g) Ankle

Type_____U-bolt

_____single bolt type

Other type (specify)_____

_____

_____

_____

h) Foot (i.e., flexion in toe, can shoe fit easily, etc.)_____

_____

_____

_____

i) Other type limbs (not listed above)_____

_____

_____

7. What part of the artificial leg needs most improvement?_____

_____

8. What types of repairs have been necessary in the last six months?_____

_____

_____

_____

_____

9. What kind of an artificial leg would you like to have?_____

_____

_____

_____

_____

PART 3

1. What do you think of the limb-maker who fitted your leg?

_____does a very competent job _____does a good job_____does a fair job

_____doesn't know what he is doing. _____does a poor job.

2. How was your limb fitted?

_____very well fitted _____well fitted _____adequately fitted

_____poorly fitted _____very poorly fitted.

3. They didn't fit this leg correctly because _____

_____

_____

_____

4. At what hospital was your amputation performed?_____

5. Where were you given your first artificial limb?_____

6. How did they treat you there?_____

_____

7. How much time was spent training you to use the leg?_____

_____

8. How was the training?

_____excellent _____ good _____fair _____poor _____worthless.

9. What was the most useful part of the training?_____

_____

_____

_____

10. What was the least useful part of the training? _____

_____

_____

_____

11. How can they improve the training?_____

_____

_____

_____

12. Has anyone given you any additional training since then? _____ yes_____no.

13. What kind of training was it?_____

_____

14. Did it help you? _____yes _____ no. How?_____

_____

15. The person (or people) who helped me most to get used to an artificial limb was (were)_____

They helped me by_____

_____

_____

16. How did the doctors treat you?

_____ did their best _____tried honestly _____tried fairly hard

_____did a so-so job_____didn't give a damn.

17. How do the limbmakers treat you?

_____do their best _____ try honestly to help _____do a so-so job

_____do what little they can_____don't give a damn.

18. If they cared more they would_____

19. Do you have any complaints about the hospital treatment you received?_____

20. Do you know what troubles are to be expected with wearing an artificial leg? _____yes _____no. What are these troubles?_____

21. Have they told you how to overcome them?_____ yes _____no.

22. What were your plans upon leaving the hospital?_____

23. Are there any services for your stump or leg you would like to receive (that are not available at present)?_____

24. I think that I can still improve in the use of my leg?_____yes _____no.

25. My suggestions for proper use of an artificial leg are_____

26. How many hours a day do you wear your artificial leg? _____ hours.

27. How many hours a day do you use crutches to get about? _____ hours.

28. What was the reason for the amputation of your leg? _____

_____

_____

_____

PART 4

SERVICE HISTORY (For World War II Veterans Only)

1. Date of Induction _____ Date of Discharge _____ Rank _____

Army _____ Navy _____ Marines ____ Serial No. _____

2. List your chief assignments while in the service.

1. _____

2. _____

3. _____

3. Assignment that I liked best was _____

4. Assignment that I liked least was _____

5. Attitude towards military life.

_____ better than civilian _____ enjoyed it _____ wasn't so bad

_____ made the best of it _____ hated it

6. Do you feel that the army or navy gave you adequate care and treatment after your amputation?

_____

_____

_____

_____

_____

WECHSLER-BELLEVUE INTELLIGENCE SCALE

FOR ADOLESCENTS AND ADULTS

RECORD FORM I

NAME_____ AGE____ EDUC.____ DATE OF EXAM._____ NO.____

OCCUP._____ NAT._____ BIRTHDATE_____ COLOR_____

PLACE OF EXAM. _____ EXAM. BY _____ PREVIOUS EXAM. _____

TABLE OF WEIGHTED SCORES†

Equivalent Weighted Score	RAW SCORE											Equivalent Weighted Score
	Information	Comprehension	Digit Span	Arithmetic	Similarities	Vocabulary	Picture Arrangement	Picture Completion	Block Design	Object Assembly	Digit Symbol	
18	25	20		14	23-24	41-42	20+		38+			18
17	24	19	17	13	21-22	39-40	20		38	26		17
16	23	18	16	12	20	37-38	19		35-37	25	66-67	16
15	21-22	17		11	19	35-36	18	15	33-34	24	62-65	15
14	20	16	15		17-18	32-34	16-17	14	30-32	23	57-61	14
13	18-19	15	14	10	16	29-31	15	13	28-29	22	53-56	13
12	17	14		9	15	27-28	14	12	25-27	20-21	49-52	12
11	15-16	12-13	13		13-14	25-26	12-13		23-24	19	45-48	11
10	13-14	11	12	9	12	22-24	11	11	20-22	18	41-44	10
9	12	10	11	7	11	20-21	10	10	18-19	17	37-40	9
8	10-11	9			9-10	17-19	9	9	16-17	16	33-36	8
7	9	8	10	6	8	15-16	7-8	8	13-15	14-15	29-32	7
6	7-8	7	9	5	7	12-14	6	7	11-12	13	24-28	6
5	6	5-6			5-6	10-11	5		8-10	12	20-23	5
4	4-5	4	8	4	4	7-9	4	6	6-7	10-11	16-19	4
3	2-3	3	7	3	3	5-6	2-3	5	3-5	9	12-15	3
2	1	2	6		1-2	3-4	1	4	1-2	8	8-11	2
1	0	1		2	0	1-2	0	3	0	7	4-7	1
0		0	5	1		0		2		5-6	0-3	0

†Clinicians who wish to draw a "psychograph" on the above table may do so by connecting the appropriate raw scores; however, one must recognize the relative unreliability of these subtest scores when they are thus treated.

SUMMARY

TEST	R.S.	WT.S.
INFORMATION		
COMPREHENSION		
DIGIT SPAN		
ARITHMETIC		
SIMILARITIES		
(VOCABULARY)	( )	( )
VERBAL SCORE*		
P. ARRANGEMENT		
P. COMPLETION		
BLOCK DESIGN		
OBJECT ASSEMBLY		
DIGIT SYMBOL		
PERFORMANCE SCORE*		
TOTAL SCORE		

*Proration is necessary if four or six Verbal tests are given or four Perfomance tests.

VERBAL SCALE_____ I.Q._____

PERFORM. SCALE_____ I.Q._____

FULL SCALE_____ I.Q._____

TEST ANALYSIS AND OBSERVATIONS

47-169 AS

1. INFORMATION	Score
(PRESIDENT)	
1 BEFORE	
2 THERMO..ER	
3 RUBBER	
4 LONDON	
5 PINTS	
6 WEEKS	
7 ITALY	
8 JAPAN	
9 HEIGHT	
10 PLANE	
11 BRAZIL	
12 PARIS	
13 HEART	
14 HAMLET	
15 POPULATION	
16 WASHINGTON	
17 POLE	
18 EGYPT	
19 H. FINN	
20 VATICAN	
21 KORAN	
22 FAUST	
23 H. CORPUS	
24 ETHNOLOGY	
25 APOCRYPHA	

2. COMPREHENSION	Score
1 ENVELOPE	
2 THEATER	
3 BAD COMPANY	
4 TAXES	
5 SHOES	
6 LAND IN CITY	
7. FOREST	
8 LAWS	
9 MARRIAGE	
10 DEAF	

3. DIGITS FORWARD	DIGITS BACKWARD
5, 8, 2	6, 2, 9
6, 9, 4	4, 1, 5
6, 4, 3, 9	3, 2, 7, 9
7, 2, 8, 6	4, 9, 6, 8
4, 2, 7, 3, 1	1, 5, 2, 8, 6
7, 5, 8, 3, 6	6, 1, 8, 4, 3
6, 1, 9, 4, 7, 3	5, 3, 9, 4, 1, 8
3, 9, 2, 4, 8, 7	7, 2, 4, 8, 5, 6
5, 9, 1, 7, 4, 2, 8	8, 1, 2, 9, 3, 6, 5
4, 1, 7, 9, 3, 8, 6	4, 7, 3, 9, 1, 2, 8
5, 8, 1, 9, 2, 6, 4, 7	9, 4, 3, 7, 6, 2, 5, 8
3, 8, 2, 9, 5, 1, 7, 4	7, 2, 8, 1, 9, 6, 5, 3
2, 7, 5, 8, 6, 2, 5, 8, 4	
7, 1, 3, 9, 4, 2, 5, 6, 8	

4. ARITHMETIC							
	T	RorW	SC.		T	RorW	SC.
1 (15")				6 (30")			
2 (15")				7 (60")			
3 (15")				8 (60")			
4 (30")				9 (120")			
5 (30")				10 (120")			

5. SIMILARITIES	Score
1 ORANGE — BANANA	
2 COAT — DRESS	
3 DOG — LION	
4 WAGON — BICYCLE	
5 PAPER — RADIO	
6 AIR — WATER	
7 WOOD — ALCOHOL	
8 EYE — EAR	
9 EGG — SEED	
10 POEM — STATUE	
11 PRAISE — PUNISHMENT	
12 FLY — TREE	

5A.	VOCABULARY	Score
1	APPLE	
2	DONKEY	
3	JOIN	
4	DIAMOND	
5	NUISANCE	
6	FUR	
7	CUSHION	
8	SHILLING	
9	GAMBLE	
10	BACON	
11	NAIL	
12	CEDAR	
13	TINT	
14	ARMORY	
15	FABLE	
16	BRIM	
17	GUILLOTINE	
18	PLURAL	
19	SECLUDE	
20	NITROGLYCERINE	
21	STANZA	
22	MICROSCOPE	
23	VESPER	
24	BELFRY	
25	RECEDE	
26	AFFLICTION	
27	PEWTER	
28	BALLAST	
29	CATACOMB	
30	SPANGLE	
31	ESPIONAGE	
32	IMMINENT	
33	MANTIS	
34	HARA-KIRI	
35	CHATTEL	
36	DILATORY	
37	AMANUENSIS	
38	PROSELYTE	
39	MOIETY	
40	ASEPTIC	
41	FLOUT	
42	TRADUCE	
	RT. ___ ½ RT. ___ TOTAL	

RT.		% RT.		TOTAL	

6	2	5	1	9	2	8	3	7	4	6	5	9	4	8	3	7	2	6	1	5	4	6	3	7

1	5	4	2	7	6	3	5	7	2	8	5	4	6	3	7	2	8	1	9	5	8	4	7	3

2	1	3	1	2	4	3	5	3	1	2	1	3	2	1	4	2	3	5	2	3	1	4	6	3

Sample

1	2	3	4	5	6	7	8	9
—	N	⊐	L	U	O	V	X	=

10. DIGIT SYMBOL TEST

6. PICTURE ARRANGEMENT

	T	ORDER	SC.
1 HOUSE (1')			
2 HOLD UP (1')			
3 ELEVATOR (1')			
4 FLIRT (2')			
5 TAXI (2')			
6 FISH (2')			

7. PICTURE COMPLETION

1 NOSE	9 HAND
2 MUSTACHE	10 WATER
3 EAR	11 ARM — IMAGE
4 DIAMOND	12 TIE
5 LEG	13 BASE THREAD
6 TAIL	14 EYEBROW
7 STACKS	15 SHADOW
8 KNOB	

8. BLOCKS

CARD	T	AC.	SC.	CARD	T	AC.	SC.
1 (75")				5 (150")			
2 (75")				6 (150")			
3 (75")				7 (150")			
4 (75")							

9. OBJECT ASSEMBLY

OBJECTS	T	PLACE	SCORE
MAN (2')			
PROFILE (3')			
HAND (3')			

FOR CALCULATING DETERIORATION (see *Measurement of Adult Intelligence*, Chapter VI)

"HOLD" TESTS	Score	"DON'T HOLD" TESTS	Score
INFORMATION		DIGIT SPAN	
VOCABULARY		ARITHMETIC	
P.COMPLETION		BLOCK DESIGN	
OBJECT ASSEMBLY		DIGIT SYMBOL	
SUM		SUM	

% OF LOSS (Deterioration)

"HOLD"_____—"DON'T HOLD"_____÷"HOLD"_____=_____

CORRECTION_____ % LOSS_____

WECHSLER-BELLEVUE INTELLIGENCE SCALE

FOR ADOLESCENTS AND ADULTS

RECORD FORM II

NAME_____ AGE____ EDUC____ DATE OF EXAM_____ NO.____

OCCUP_____ NAT._____ BIRTHDATE_____ COLOR____

PLACE OF EXAM._____ EXAM. BY _____ PREVIOUS EXAM._____

TABLE OF WEIGHTED SCORES†

Equivalent Weighted Score	RAW SCORE											Equivalent Weighted Score
	Information	Comprehension	Digit Span	Arithmetic	Similarities	Vocabulary	Picture Arrangement	Picture Completion	Block Design	Object Assembly	Digit Symbol	
17		19-20	17	26-28	24	42-45	23-30		43-44		90-93	17
16	29-30	18	16	24-25	22-23	40-41	21-22		40-42	27	85-89	16
15	27-28	17		22-23	20-21	38-39	19-20	15	37-39	26	80-84	15
14	25-26	16	15	21	19	36-37	18		34-36	25	75-79	14
13	24	15	14	19-20	17-18	33-35	16-17	14	31-33	23-24	70-74	13
12	22-23	14		18	15-16	31-32	15	13	28-30	21-22	65-69	12
11	20-21	13	13	16-17	14	29-30	13-14	11-12	25-27	19-20	60-64	11
10	19	12	12	15	12-13	27-28	11-12	10	22-24	18	55-59	10
9	17-18	10-11	11	13-14	11	24-26	10	9	19-21	16-17	49-54	9
8	15-16	9		11-12	9-10	22-23	8-9	8	16-18	14-15	44-48	8
7	13-14	8	10	10	7-8	20-21	7	7	13-15	12-13	39-43	7
6	12	7	9	8-9	6	17-19	6	6	10-12	10-11	34-38	6
5	10-11	5-6		7	5	15-16	4-5	5	7-9	8-9	29-33	5
4	8-9	4	8	5-6	4	13-14	3	4	5-6	6-7	24-28	4
3	6-7	3	7	4	2-3	10-12	2		3-4	4-5	19-23	3
2	5	2	6	2-3	1	8-9		3	1-2	3	14-18	2
1	3-4	1		0-1		6-7	0	2	0	2	9-13	1
0	0-2	0	0-5			0-5		0-1		0-1	0-8	0

†Clinicians who wish to draw a "psychograph" on the above table may do so by connecting the appropriate raw scores; however, one must recognize the relative unreliability of these subtest scores when they are thus treated.

SUMMARY

TEST	R.S.	WT.S.
INFORMATION		
COMPREHENSION		
DIGIT SPAN		
ARITHMETIC		
SIMILARITIES		
VOCABULARY		
VERBAL SCORE		
P. ARRANGEMENT		
P. COMPLETION		
BLOCK DESIGN		
(OBJECT ASSEMBLY)		
DIGIT SYMBOL		
PERFORMANCE SCORE		

	WT.S.*	I.Q.
VERBAL SCALE		
PERFORM. SCALE		
FULL SCALE		

*PRORATED, IF NECESSARY (See Manual)

TEST ANALYSIS AND OBSERVATIONS

47-179 AS

1. INFORMATION	Score
A EARS	
B FINGER	
C LEGS	
D MILK	
E STORE — SUGAR	
F PENNIES	
1 DAYS	
2 WATER — BOIL	
3 THINGS — DOZEN	
4 SEASONS — YEAR	
5 C.O.D.	
6 COLOR — RUBIES	
7 FOURTH — JULY	
8 CHILE	
9 POUNDS — TON	
10 ROMEO — JULIET	
11 SUN — SET	
12 STOMACH	
13 AMERICAN — MAN	
14 CAPITAL — GREECE	
15 OIL — FLOAT	
16 LABOR DAY	
17 TURPENTINE	
18 N. Y. — CHICAGO	
19 RAYON	
20 HARROW	
21 HIEROGLYPHIC	
22 IMPEACH	
23 LIEN	
24 GHENGIS KHAN	
25 PARADISE LOST	
26 BAROMETER	
27 PRIME NUMBER	

2. COMPREHENSION	Score
1 BOOK (WATCH)	
2 HOUSE — BRICK	
3 TRAIN	
4 CHARITY — BEGGAR	
5 FRIEND	
6 CRIMINALS	
7 CIVIL SERVICE	
8 CITIZEN	
9 COTTON — CLOTH	
10 PROMISE	

3. DIGITS FORWARD	DIGITS BACKWARD
(3) 3, 8, 6 6, 1, 2	(2) 2, 5 6, 3
(4) 3, 4, 1, 7 6, 1, 5, 8	(3) 5, 7, 4 2, 5, 9
(5) 8, 4, 2, 3, 9 5, 2, 1, 8, 6	(4) 7, 2, 9, 6 8, 4, 1, 3
(6) 3, 9, 9, 1, 7, 4 7, 9, 6, 4, 8, 3	(5) 4, 1, 6, 2, 7 9, 7, 8, 5, 2
(7) 5, 1, 7, 4, 2, 3, 8 9, 8, 5, 2, 1, 6, 3	(6) 1, 6, 5, 2, 9, 8 3, 6, 7, 1, 9, 4
(8) 1, 6, 4, 5, 9, 7, 6, 3 2, 9, 7, 6, 3, 1, 5, 4	(7) 8, 5, 9, 2, 3, 4, 2 4, 5, 7, 9, 2, 8, 1
(9) 5, 3, 8, 7, 1, 2, 4, 6, 9 4, 2, 6, 9, 1, 7, 8, 3, 5	(8) 6, 9, 1, 6, 3, 2, 5, 8 3, 1, 7, 9, 5, 4, 8, 2

4. ARITHMETIC	T	R or W	SC.		T	R or W	SC.
1 (15")				6 (60")			
2 (15")				7 (60")			
3 (15")				8 (120")			
4 (30")				9 (120")			
5 (30")				10 (120")			

5. SIMILARITIES	Score
1 PLUM — PEACH	
2 BEER — WINE	
3 CAT — MOUSE	
4 PIANO — VIOLIN	
5 PAPER — COAL	
6 POUND — YARD	
7 SCISSORS — COPPER PAN	
8 MOUNTAIN — LAKE	
9 FIRST — LAST	
10 SALT — WATER	
11 LIBERTY — JUSTICE	
12 49 — 121	

5A.	VOCABULARY	Score
1	BICYCLE	
2	KNIFE	
3	HAT	
4	APPLE	
5	DONKEY	
6	BOX	
7	BAD	
8	UMBRELLA	
9	BRAVE	
10	NUISANCE	
11	DIAMOND	
12	LETTER	
13	JOIN	
14	FUR	
15	CUSHION	
16	NAIL	
17	GAMBLE	
18	SPADE	
19	SHILLING	
20	FABLE	
21	SWORD	
22	NONSENSE	
23	HERO	
24	NITROGLYCERINE	
25	MICROSCOPE	
26	ESPIONAGE	
27	STANZA	
28	SECLUDE	
29	SPANGLE	
30	BELFRY	
31	RECEDE	
32	AFFLICTION	
33	BALLAST	
34	CATACOMB	
35	IMMINENT	
36	MANTIS	
37	HARA-KIRI	
38	VESPER	
39	ASEPTIC	
40	CHATTEL	
41	DILATORY	
42	AMANUENSIS	
43	MOIETY	
44	FLOUT	
45	TRADUCE	

RT.		½ RT.		TOTAL	

NO. RT.

9	1	5	8	7	6	9	7	8	2	4	8	3	5	6	7	1	9	4	3	6	2	7	9	3

1	8	2	9	7	6	2	5	4	7	3	6	8	5	9	4	1	6	8	9	3	7	5	1	4

3	1	5	4	2	7	4	6	9	2	5	8	4	7	6	1	8	7	5	4	8	6	9	4	3

2	1	4	6	3	5	2	1	3	4	2	1	3	1	2	3	1	4	2	6	3	1	2	5	1

SAMPLE

1	2	3	4	5	6	7	8	9
÷	)	+	⊢	L	V	(	÷	⊣

10. DIGIT SYMBOL TEST

6. PICTURE ARRANGEMENT

	T	ORDER	SC.
1 FARMER (45")			
2 BURGLAR (45")			
3 PICNIC (45")			
4 SLEEPER (75")			
5 GARDENER (60")			
6 KING (60")			
7 RAIN (75")			

7. PICTURE COMPLETION

1 MOUTH	9 ANTENNAE
2 WHISKERS	10 MERCURY
3 DOOR HINGE	11 HATBAND
4 SCREW	12 SPOKES
5 SPUR	13 CLEFT
6 SPADE	14 SHADOW
7 BUTTONHOLES	15 EYEBROW
8 FIN	

8. BLOCKS

CARD	T	AC.	SC.	CARD	T	AC.	SC.
DEM.				4 (75")			
1 (75")				5 (150")			
2 (75")				6 (150")			
3 (75")				7 (150")			

9. OBJECT ASSEMBLY

OBJECT	T	PLACE	SCORE
HORSE (3')			
FACE (3')			
AUTO (3')			

FOR CALCULATING DETERIORATION (see *Measurement of Adult Intelligence*, Chapter VI)

"HOLD" TESTS	Score	"DON'T HOLD" TESTS	Score
INFORMATION		DIGIT SPAN	
VOCABULARY		ARITHMETIC	
P.COMPLETION		BLOCK DESIGN	
OBJECT ASSEMBLY		DIGIT SYMBOL	
SUM		SUM	

% OF LOSS (Deterioration)

"HOLD"_____—"DON'T HOLD"_____÷"HOLD"_____=_____

CORRECTION_____ % LOSS_____

THE ADJUSTMENT INVENTORY

ADULT FORM

By HUGH M. BELL

Published by
STANFORD UNIVERSITY PRESS
Stanford University, California

NAME _____ SEX _____ OCCUPATION _____

MARRIED OR SINGLE _____ EDUCATION (HIGH-SCHOOL GRADUATE, ETC.) _____ DATE _____

DIRECTIONS

Are you interested in knowing more about your own personality? If you will answer *honestly* and *thoughtfully* all of the questions on the pages that follow, it will be possible for you to obtain a better understanding of yourself. These questions have been carefully selected, and then given to a large number of persons. By comparing your answers with the answers of the group you will secure a more accurate notion of your own characteristics. The value of this to you will be in proportion to the care and honesty with which you answer each question.

Your answers to the questions will be treated in the strictest confidence. Therefore, feel free to give candid replies. There are no *right* or *wrong* answers. Indicate your answer to each question by drawing a circle around the "Yes," the "No," or the "?." Use the question mark *only* when you are certain that you cannot answer "Yes," or "No." There is no time limit; but work rapidly.

If you are not employed now, answer the occupational questions with reference to the last position which you held. Housewives who are not employed outside the home should omit the questions referring to working conditions.

NO.	SCORE	DESCRIPTION	REMARKS
a			
b			
c			
d			
e			

1a	Yes	No	?	Does the place in which you live now in any way interfere with your obtaining the social life which you would like to enjoy?
2d	Yes	No	?	Do you have ups and downs in mood without apparent cause?
3b	Yes	No	?	Are you troubled occasionally by a skin disease or skin eruption such as athlete's foot, carbuncles, or boils?
4c	Yes	No	?	Do you feel self-conscious when you have to ask an employer for work?
5e	Yes	No	?	Do you sometimes get badly flustered and "jittery" in your present job?
6b	Yes	No	?	Have you had any trouble with your heart or your kidneys or your lungs?
7a	Yes	No	?	Do you feel that your present home environment allows you enough opportunity to develop your own personality?
8c	Yes	No	?	Do you like to participate in festival gatherings and lively parties?
9e	Yes	No	?	Do you think you made the wrong selection of your occupation?
10d	Yes	No	?	Have you ever been extremely afraid of something which you knew could do you no harm?
11a	Yes	No	?	Is any member of your present home very nervous?
12e	Yes	No	?	Does your present work allow you time off each year for some vacation?
13b	Yes	No	?	Have you ever been anemic (lacking in red blood corpuscles)?
14d	Yes	No	?	Do you worry too long over humiliating experiences?
15e	Yes	No	?	Do you find it difficult to start a conversation with a stranger?
16a	Yes	No	?	Did you disagree with your parents about the type of occupation you should enter?
17c	Yes	No	?	Does it upset you considerably to have some one ask you to speak when you have had no time to prepare your talk?
18d	Yes	No	?	Does some particular useless thought keep coming into your mind to bother you?
19b	Yes	No	?	Do you take cold rather easily from other people?
20e	Yes	No	?	Do you think you must "play politics" to get promotion or an increase in pay in your present job?
21c	Yes	No	?	Do you keep in the background on social occasions?
22a	Yes	No	?	Have you had unpleasant disagreements over such matters as religion, politics, or sex with the person or persons with whom you live?
23d	Yes	No	?	Do you get upset easily?
24b	Yes	No	?	Do you find it necessary to watch your health carefully?
25a	Yes	No	?	Has there ever been a divorce among any members of your immediate family?
26e	Yes	No	?	Has your employer always treated you fairly?
27b	Yes	No	?	Do you frequently come to your meals without really being hungry?
28d	Yes	No	?	Are you often in a state of excitement?
29c	Yes	No	?	Do you feel embarrassed if you have to ask permission to leave a group of people?
30e	Yes	No	?	Do you think that you have to work too long hours on your present job?
31a	Yes	No	?	Have any of the members of your present home made you unhappy by criticising your personal appearance?
32c	Yes	No	?	Do you find that you tend to have a few close friends rather than many casual acquaintances?
33b	Yes	No	?	Have you had an illness from which you feel that you have not completely recovered?
34d	Yes	No	?	Does criticism disturb you greatly?
35e	Yes	No	?	Are you happy and contented in your present home environment?
36c	Yes	No	?	Would you like to secure some other job than the one you now hold?
37c	Yes	No	?	Are you often the center of favorable attention at a party?
38b	Yes	No	?	Do you frequently have shooting pains in the head?
39d	Yes	No	?	Are you troubled with the idea that people are watching you on the street?
40a	Yes	No	?	Do you feel a lack of affection and love in your present home?
41c	Yes	No	?	Do you have considerable difficulty in knowing just where you stand with your present employer?
42b	Yes	No	?	Do you suffer from sinusitis or any obstruction in your breathing?
43d	Yes	No	?	Are you bothered by the feeling that people are reading your thoughts?
44c	Yes	No	?	Do you make friends readily?
45e	Yes	No	?	Do you feel that your present employer or boss holds a personal dislike or grudge toward you?
46a	Yes	No	?	Do the person or persons with whom you now live understand you and sympathise with you?
47d	Yes	No	?	Do you day-dream frequently?
48b	Yes	No	?	Has any illness you have had resulted in a permanent injury to your health?
49e	Yes	No	?	Do you have to work on your present job with certain people whom you dislike?
50c	Yes	No	?	Do you hesitate to enter a room by yourself when a group of people are sitting around talking together?
51a	Yes	No	?	Do you feel that your friends have happier home environments than you?
52e	Yes	No	?	Do you often hesitate to speak out in a group lest you say and do the wrong thing?
53b	Yes	No	?	Do you have difficulty in getting rid of a cold?
54d	Yes	No	?	Do ideas often run through your head so that you cannot sleep?

58a	Yes	No	?	Does any person with whom you live now become angry at you very easily?
59e	Yes	No	?	Are you getting enough pay on your present job to support those who are dependent upon you?
57b	Yes	No	?	Are you troubled with too high or too low blood pressure?
58d	Yes	No	?	Do you worry over possible misfortunes?
59c	Yes	No	?	If you come late to a meeting would you rather stand or leave than take a front seat?
60e	Yes	No	?	Is your present boss or employer an individual whom you feel you can always trust?
61b	Yes	No	?	Are you subject to hay fever or asthma?
62a	Yes	No	?	Are the members of your present home congenial and well-suited to each other?
63c	Yes	No	?	At a reception or a tea do you seek to meet the important person present?
64e	Yes	No	?	Do you feel that your employer is paying you a fair salary?
65d	Yes	No	?	Are your feelings easily hurt?
66b	Yes	No	?	Are you troubled much with constipation?
67a	Yes	No	?	Do you dislike intensely certain people with whom you live now?
68c	Yes	No	?	Are you sometimes the leader at a social affair?
69e	Yes	No	?	Do you like all the people with whom you work on your present job?
70d	Yes	No	?	Are you bothered by the feeling that things are not real?
71a	Yes	No	?	Do you occasionally have conflicting moods of love and hate for members of your immediate family?
72c	Yes	No	?	Do you feel very self-conscious in the presence of people whom you greatly admire but with whom you are not well acquainted?
73b	Yes	No	?	Do you frequently experience nausea or vomiting or diarrhea?
74d	Yes	No	?	Do you blush easily?
75a	Yes	No	?	Have the actions of any person with whom you now live frequently caused you to feel blue and depressed?
76e	Yes	No	?	Have you frequently changed jobs during the last five years?
77c	Yes	No	?	Do you ever cross the street to avoid meeting somebody?
78b	Yes	No	?	Are you subject to tonsillitis or other throat ailments?
79d	Yes	No	?	Do you often feel self-conscious because of your personal appearance?
80e	Yes	No	?	Does your present job fatigue you greatly?
81a	Yes	No	?	Is the home where you live now often in a state of turmoil and dissension?
82d	Yes	No	?	Do you consider yourself rather a nervous person?
83c	Yes	No	?	Do you greatly enjoy social dancing?
84b	Yes	No	?	Are you subject to attacks of indigestion?
85a	Yes	No	?	Did either of your parents frequently find fault with your conduct when you lived with them?
86e	Yes	No	?	Do you feel that you have adequate opportunities to express your own ideas in your present job?
87c	Yes	No	?	Do you find it very difficult to speak in public?
88b	Yes	No	?	Do you feel tired most of the time?
89e	Yes	No	?	Is the pay in your present work so low that you worry lest you be unable to meet your financial obligations?
90d	Yes	No	?	Are you troubled with feelings of inferiority?
91a	Yes	No	?	Do the personal habits of some of the people with whom you now live irritate you?
92d	Yes	No	?	Do you often feel just miserable?
93b	Yes	No	?	Has it been necessary for you to have frequent medical attention?
94c	Yes	No	?	Have you had a number of experiences in appearing before public gatherings?
95e	Yes	No	?	Have you been able to get the promotions you desire in your present job?
96a	Yes	No	?	Does any member of your present home try to dominate you?
97b	Yes	No	?	Do you often feel fatigued when you get up in the morning?
98e	Yes	No	?	Do any of the people with whom you work have personal habits and characteristics which irritate you?
99c	Yes	No	?	When you are a guest at an important dinner do you do without something rather than ask to have it passed to you?
100d	Yes	No	?	Does it frighten you to be alone in the dark?
101a	Yes	No	?	Did your parents tend to supervise you too closely when you lived with them?
102c	Yes	No	?	Have you found it easy to make friendly contacts with members of the opposite sex?
103b	Yes	No	?	Are you considerably underweight?
104e	Yes	No	?	Does your present job force you to hurry a great deal?
105d	Yes	No	?	Have you ever, when you were on a high place, been afraid that you might jump off?
106a	Yes	No	?	Do you find it easy to get along with the person or persons with whom you live now?
107e	Yes	No	?	Do you have difficulty in starting conversation with a person to whom you have just been introduced?
108b	Yes	No	?	Do you frequently have spells of dizziness?
109d	Yes	No	?	Are you often sorry for the things you do?
110e	Yes	No	?	Does your present employer or boss take all the credit for a piece of work which you have done yourself?

111a	Yes	No	?	Do you have frequent disagreements with the individual or individuals where you live now concerning the way things are to be done about the house?
112d	Yes	No	?	Do you get discouraged easily?
113b	Yes	No	?	Have you had considerable illness during the last ten years?
114c	Yes	No	?	Have you had experience in making plans for and directing the actions of other people such as committee chairman, leader of a group, etc.?
115e	Yes	No	?	Do you feel that you are just a cog in an inhuman machine in your present job?
116a	Yes	No	?	Does any person in the place you now live frequently object to the companions and friends with whom you like to associate?
117b	Yes	No	?	Are you subject to attacks of influenza?
118e	Yes	No	?	Does your present employer or boss praise you for work which you do well?
119c	Yes	No	?	Would you feel very self-conscious if you had to volunteer an idea to start a discussion among a group of people?
120d	Yes	No	?	Have you frequently been depressed because of the unkind things others have said about you?
121a	Yes	No	?	Are any of the members of your present household very easily irritated?
122b	Yes	No	?	Do you have many colds?
123d	Yes	No	?	Are you easily frightened by lightning?
124c	Yes	No	?	Are you troubled with shyness?
125e	Yes	No	?	Did you enter your present job because you yourself really wanted to go into it?
126c	Yes	No	?	Have you ever had a major surgical operation?
127a	Yes	No	?	At home did your parents frequently object to the kind of companions you went around with?
128c	Yes	No	?	Do you find it easy to ask others for help?
129e	Yes	No	?	Do you get discouraged in your present work?
130d	Yes	No	?	Do things often go wrong for you from no fault of your own?
131a	Yes	No	?	Would you like very much to move from the place where you now live so that you might have more personal independence?
132c	Yes	No	?	When you want something from a person with whom you are not very well acquainted, would you prefer to write a note or letter to the individual than go and ask him or her personally?
133b	Yes	No	?	Have you ever been seriously injured in any kind of an accident?
134d	Yes	No	?	Do you dread the sight of a snake?
135e	Yes	No	?	Do you feel that your work is supervised by too many different bosses?
136b	Yes	No	?	Have you lost considerable weight recently?
137a	Yes	No	?	Does the lack of money tend to make your present home life unhappy?
138c	Yes	No	?	Would it be difficult for you to give an oral report before a group of people?
139e	Yes	No	?	Is your present job very monotonous?
140d	Yes	No	?	Are you easily moved to tears?
141b	Yes	No	?	Do you frequently feel very tired toward the end of the day?
142a	Yes	No	?	When you lived with your parents did either of them frequently criticize you unjustly?
143d	Yes	No	?	Does the thought of an earthquake or a fire frighten you?
144c	Yes	No	?	Do you feel embarrassed when you have to enter a public assembly by yourself after everyone else has been seated?
145e	Yes	No	?	Do you find that you have very little real interest in your present job?
146b	Yes	No	?	Do you sometimes have difficulty getting to sleep even when there are no noises to disturb you?
147a	Yes	No	?	Is there anyone at the place where you live now who insists on your obeying him or her regardless of whether or not the request is reasonable?
148c	Yes	No	?	Did you ever take the lead to enliven a dull party?
149e	Yes	No	?	Do you feel that your immediate superior or boss lacks sympathy and understanding in dealing with you as an employee?
150d	Yes	No	?	Do you often feel lonesome even when you are with people?
151a	Yes	No	?	As a youth did you ever have a strong desire to run away from home?
152b	Yes	No	?	Do you have many headaches?
153d	Yes	No	?	Have you ever felt that someone was hypnotizing you and making you act against your will?
154c	Yes	No	?	Do you often have much difficulty in thinking of an appropriate remark to make in group conversation?
155e	Yes	No	?	Do you sometimes feel that your employer does not show real appreciation of your attempts to do your job in a superior manner?
156b	Yes	No	?	Have you ever had scarlet fever or diphtheria?
157a	Yes	No	?	Do you sometimes feel that you have been a disappointment to your parents?
158c	Yes	No	?	Do you take responsibility for introducing people at a party?
159e	Yes	No	?	Do you experience a fear of losing your present job?
160d	Yes	No	?	Do you frequently have spells of the blues?

P-S EXPERIENCE BLANK

Name ..... Date .....
Last name First name

Address .....

Age ..... Sex ..... Occupation .....
Years

Last grade completed in school or college (encircle the proper one)

Grade School								High School				College						
1	2	3	4	5	6	7	8	1	2	3	4	1	2	3	4	5	6	7

Do not write in this space

	Part I	Part II	Total
Raw score			
Constant (subtract)	176	249	425
Final score			
Percentile			

INSTRUCTIONS:

Your answers to the questions in Part I and Part II permit you to state some of your past experiences. This is Not an intelligence test. There are no right nor wrong answers. After each question you will find the words, OFTEN, AT-TIMES, SELDOM, NEVER.

OFTEN means frequently;
AT-TIMES means occasionally or now-and-then;
SELDOM means rarely or infrequent;
NEVER means not at all.

by

ROSS A. MCFARLAND AND CLIFFORD P. SEITZ

The Psychological Corporation
New York, New York

46-167T

Part I

Read each question carefully and

UNDERLINE THE RESPONSE WHICH YOU THINK BEST DESCRIBES YOU.

1.	Feel well and happy?	Often	At-Times	Seldom	Never
2.	Spells of dizziness?	Often	At-Times	Seldom	Never
3.	Pain in stomach or abdomen?	Often	At-Times	Seldom	Never
4.	Headache, pressure, or pains in head?	Often	At-Times	Seldom	Never
5.	Constipation?	Often	At-Times	Seldom	Never
6.	Ringing or buzzing in ears?	Often	At-Times	Seldom	Never
7.	Constant repetition of movements or acts?	Often	At-Times	Seldom	Never
8.	Heart thump in ears?	Often	At-Times	Seldom	Never
9.	Queer unpleasant feelings in body?	Often	At-Times	Seldom	Never
10.	Good appetite?	Often	At-Times	Seldom	Never
11.	Worry about health?	Often	At-Times	Seldom	Never
12.	Twitching of face, hands, or shoulders?	Often	At-Times	Seldom	Never
13.	Urinate frequently?	Often	At-Times	Seldom	Never
14.	Vomiting or nausea?	Often	At-Times	Seldom	Never
15.	Fatigued or exhausted?	Often	At-Times	Seldom	Never
16.	Mist before the eyes?	Often	At-Times	Seldom	Never
17.	Insomnia or sleeplessness?	Often	At-Times	Seldom	Never
18.	Excited or nervous (inward tension)?	Often	At-Times	Seldom	Never
19.	Gas on stomach (belch)?	Often	At-Times	Seldom	Never
20.	Well rested in morning?	Often	At-Times	Seldom	Never
21.	Difficulty in breathing?	Often	At-Times	Seldom	Never
22.	Physically depressed or miserable?	Often	At-Times	Seldom	Never
23.	Fidgety and restless?	Often	At-Times	Seldom	Never
24.	Stuttering or blocking of speech?	Often	At-Times	Seldom	Never
25.	Pains in the eyes?	Often	At-Times	Seldom	Never
26.	Feelings of suffocation (difficulty in getting air)?	Often	At-Times	Seldom	Never
27.	Shaking and trembling?	Often	At-Times	Seldom	Never
28.	Pains in neck, chest, or back?	Often	At-Times	Seldom	Never
29.	Great effort to do things?	Often	At-Times	Seldom	Never
30.	Indigestion or upset stomach?	Often	At-Times	Seldom	Never
31.	Feel faint or do faint?	Often	At-Times	Seldom	Never
32.	Upset at sight of blood?	Often	At-Times	Seldom	Never
33.	Extremely sensitive to noises?	Often	At-Times	Seldom	Never
34.	Aching of muscles without exercise?	Often	At-Times	Seldom	Never
35.	Difficulty in concentrating?	Often	At-Times	Seldom	Never
36.	Rapid beating of heart without exercise?	Often	At-Times	Seldom	Never
37.	Short of breath?	Often	At-Times	Seldom	Never
38.	Hear imaginary sounds or noises?	Often	At-Times	Seldom	Never
39.	Tired without working?	Often	At-Times	Seldom	Never
40.	Parts of body stiff or not movable?	Often	At-Times	Seldom	Never
41.	Jumpy or easily startled?	Often	At-Times	Seldom	Never
42.	Spells of hot or cold?	Often	At-Times	Seldom	Never
43.	Pay great deal of attention to body?	Often	At-Times	Seldom	Never
44.	Feel nervously broken down?	Often	At-Times	Seldom	Never
45.	Weep easily?	Often	At-Times	Seldom	Never
46.	Fussy about food and eating?	Often	At-Times	Seldom	Never

Part II

Read each question carefully and
UNDERLINE THE RESPONSE WHICH YOU THINK BEST DESCRIBES YOU.

1.	Troubled with shyness?	Often	At-Times	Seldom	Never
2.	Worry too long over humiliating experiences?	Often	At-Times	Seldom	Never
3.	Afraid of falling when on high places?	Often	At-Times	Seldom	Never
4.	Feelings easily hurt?	Often	At-Times	Seldom	Never
5.	Habit of leaving many tasks unfinished?	Often	At-Times	Seldom	Never
6.	Feelings alternate between happiness and sadness without apparent reason?	Often	At-Times	Seldom	Never
7.	Daydream frequently?	Often	At-Times	Seldom	Never
8.	Cross street to avoid meeting someone?	Often	At-Times	Seldom	Never
9.	Tire of amusements quickly?	Often	At-Times	Seldom	Never
10.	Get discouraged easily?	Often	At-Times	Seldom	Never
11.	Things go wrong for you by no fault of your own?	Often	At-Times	Seldom	Never
12.	Like to be by yourself a great deal?	Often	At-Times	Seldom	Never
13.	Bothered by having people watch you at work even when you work well?	Often	At-Times	Seldom	Never
14.	Stand criticism without feeling hurt?	Often	At-Times	Seldom	Never
15.	Interests change quickly?	Often	At-Times	Seldom	Never
16.	Queer feeling as if you were not your old self?	Often	At-Times	Seldom	Never
17.	Feel grouchy?	Often	At-Times	Seldom	Never
18.	Experience periods of loneliness?	Often	At-Times	Seldom	Never
19.	Feel just miserable?	Often	At-Times	Seldom	Never
20.	Self-conscious in presence of superiors?	Often	At-Times	Seldom	Never
21.	Lack self-confidence?	Often	At-Times	Seldom	Never
22.	Plan your work ahead?	Often	At-Times	Seldom	Never
23.	Trouble deciding what to do next?	Often	At-Times	Seldom	Never
24.	Feel compelled to do things?	Often	At-Times	Seldom	Never
25.	Consider yourself lucky?	Often	At-Times	Seldom	Never
26.	Constantly recurring ideas or thoughts?	Often	At-Times	Seldom	Never
27.	Dislike to enter a subway or tunnel?	Often	At-Times	Seldom	Never
28.	Desire to commit suicide?	Often	At-Times	Seldom	Never
29.	People find fault with you more than you deserve?	Often	At-Times	Seldom	Never
30.	Get irritated or upset easily?	Often	At-Times	Seldom	Never
31.	Tire of work quickly?	Often	At-Times	Seldom	Never
32.	Slow in making a decision?	Often	At-Times	Seldom	Never
33.	Look for sympathy?	Often	At-Times	Seldom	Never
34.	Difficulty in making friends?	Often	At-Times	Seldom	Never
35.	Get so discouraged cannot work properly?	Often	At-Times	Seldom	Never
36.	Feel sorry for yourself?	Often	At-Times	Seldom	Never
37.	Have sex dreams?	Often	At-Times	Seldom	Never
38.	Feel afraid in many situations?	Often	At-Times	Seldom	Never
39.	Feel mentally inferior to friends?	Often	At-Times	Seldom	Never
40.	Worry about sex matters?	Often	At-Times	Seldom	Never
41.	Experience failure?	Often	At-Times	Seldom	Never
42.	Mind wanders easily?	Often	At-Times	Seldom	Never
43.	Worry over trifles?	Often	At-Times	Seldom	Never
44.	Experience fear of death?	Often	At-Times	Seldom	Never
45.	Feelings of guilt or sinfulness?	Often	At-Times	Seldom	Never
46.	Thoughts of doing violence to others?	Often	At-Times	Seldom	Never

I

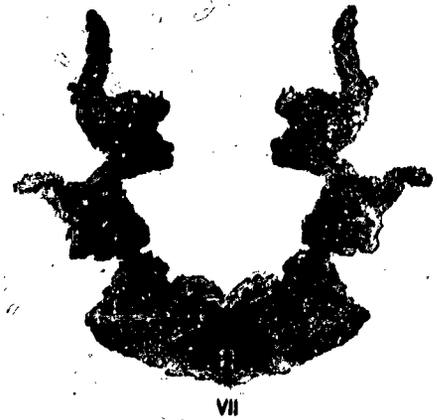
II

III

IV

V

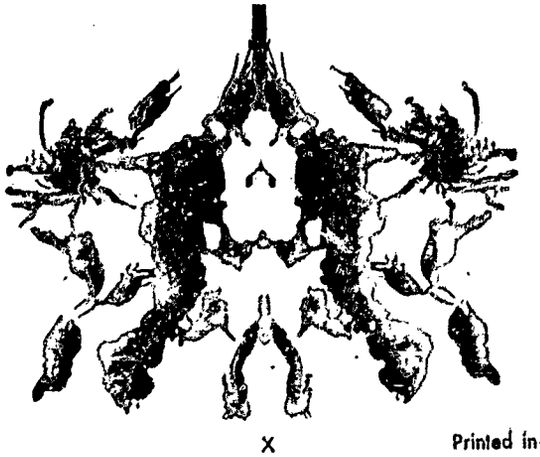
VI



VII

VIII

IX



X

Printed in U. S. A.

NAME _____ DATE _____

EXAMINER _____ SCORER _____

INTERPRETER _____

RORSCHACH RECORD SHEET

RORSCHACH INSPECTION RECORD (RESEARCH FORM)

Identifying Data

NUMBER of R

T/R 60" 50" (+,-)

Refusal ( )

LOCATION

W (+,-,V,B)

Dd (+)

S (+)

Suc (r,l)

CONTENT

P, Com (-)

Φ (+,B)

At, Sex (+)

Range (+,-)

FORM

F% (+,-)

F (V,B, E)

SHADING

Shading Shock (+) ( )

FK, Fc (+,-)

c (+)

C' (+)

K,k (+)

MOVEMENT

M (+,-,B,r,d)

FM, Fm, m (+,-)

m (+)

Total Movement (+,-)

COLOR

Color Shock (+) ( )

FC (-, B)

CF, CF:FC (+,-)

C 1, Cn, (+)

Total Color (+,-)

Color: Movement (+,-)

Total Number of Checks

NAME_____ ADDRESS_____ EXAMINER_____

RORSCHACH SUMMARY

	W___	F+	Fc
W		F	c
W		F-	K
DW		M	FK
	D___	M+	KF
D		M-	Fk
DS		FM	
	d___	Fm	A
d		m	Ad
ds		FC	H
	Dd___	CF	Hd
dd		C	(H)
de		Cn	A obj
di		des	A at
dr		sym	At
F		FC'	Sex
		C'F	Blood
		C'	Abst
			Art

Ap: W%

D%
d%
Dd%

Seq:

F%
F+%

A%
S
P
O

1. Sum M : Sum C
2. FM+Fm+m : Fc+c+FC'+C'+C'F
3. $\frac{\text{VIII+IX+X+}}{\text{R}}$ equals ____%
4. T/R
5. T/1R
6. $\frac{\text{T/1R Achromatic}}{\text{T/1R Chromatic}}$ ____

	Card I	Card II	Card III	Card IV	Card V	Card VI	Card VII	Card VIII	IX	X
T/1R										
R1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

POPULARS

I. (W) Bat or butterfly
II. (F) any two animals
III. (D) butterfly (lower red)
(D) butterfly (red central)
(F) human figures
IV. (W) animal skin or (F)
V. (W) bat, butterfly or moth
VI. (W-F) animal skin
VII.
VIII. (D) animals)lateral)
IX.
X. (lateral blue D)
(crab, spider or octopus)
(lower green D)
rabbit's head

TESTING THE LIMITS
(For popular responses)

	10 CARDS PRESENTED	INDIVIDUAL CARD PRESENTED	FIGURE OUTLINED
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

RESEARCH DIVISION
COLLEGE OF ENGINEERING
NEW YORK UNIVERSITY

ATTITUDE SCALE

NAME _____ ADDRESS _____

1. I can't seem to realize _____

2. I often think that _____

3. The way I feel about the U.S. Army is _____

4. As for my mother _____

5. My father is the sort of man who _____

6. We got into the war on account of _____

7. The way I feel about the guys who never went overseas is _____

8. The way I look at the war now is _____

9. I think that my luck would have been different if _____

10. The medical doctors in the army were _____

11. The surgeon who performed my amputation did_____

12. The hospital care was_____

13. One thing I wish they had done was_____

14. I think that life is_____

15. I wish that I had_____

16. When I think about my amputation I_____

17. What I want people to do is_____

18. When I think about working I feel_____

19. When I think about dancing I just_____

20. When I think about marrying I say to myself_____

21. When I think about having children I say to myself_____

22. My family has acted in a way that_____

23. People have treated me in a way that_____

24. Of all my brothers and sisters, I am_____

25. When I look at myself I begin to_____

26. Other people seem to_____

27. I just can't_____

28. My greatest fear is_____

29. What I need most is_____

30. The thing I hate most is_____

31. What I need is_____

32. I wish that_____

33. My greatest worry is_____

34. Girls don't seem to_____

35. The way things are going now it seems to me that_____

36. The thing that I would like to have now is_____

37. My greatest ambition is_____

38. My plans for the future include_____

39. When I sleep at night I_____

40. Sometimes I feel as though I just have to_____

41. When I compare myself with others I think_____

42. The way I prefer to spend my spare time is_____

43. The thing I like best about my work is_____

44. The thing that gets me sore is_____

45. You would think that people_____

46. Before the war I_____

47. Some day I am going to_____

48. As for religion I believe_____

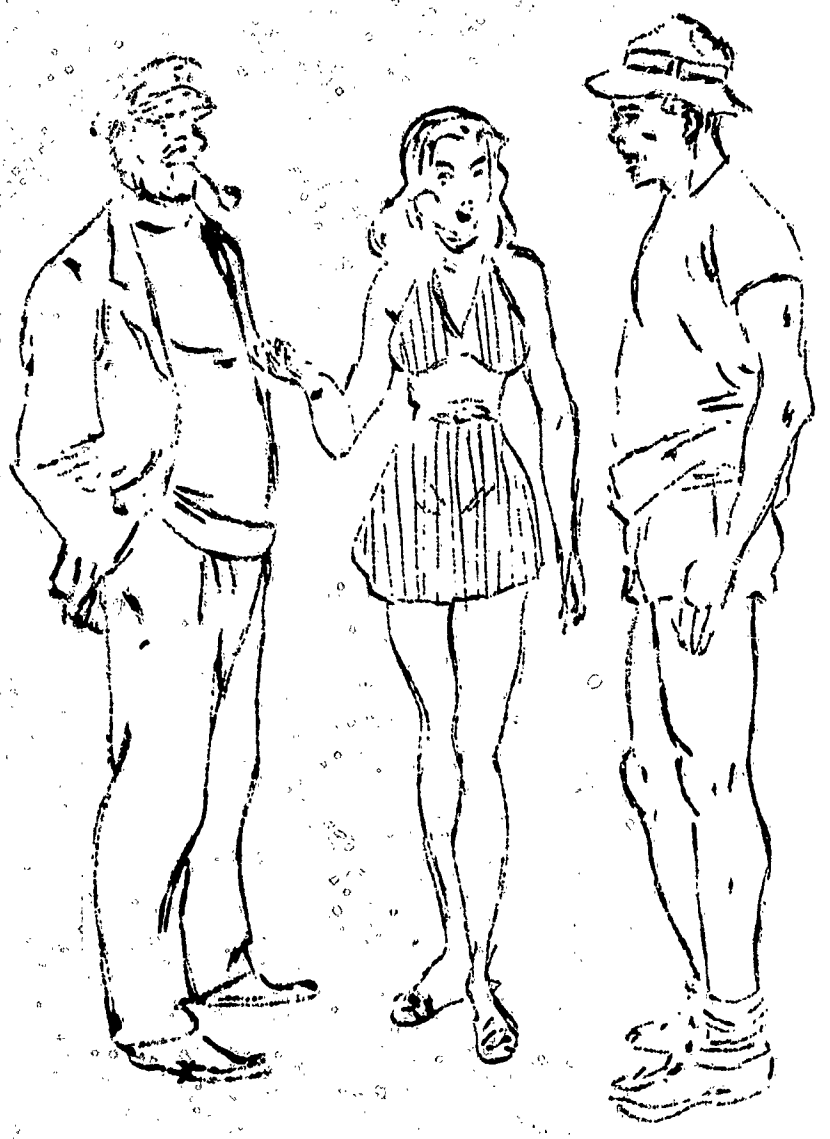
49. As far as money is concerned I_____

50. As for the future I_____

Research Division
College of Engineering
New York University

THEMATIC APPERCEPTION TEST MODIFICATIONS

Order Administered	Description of Picture
1st card	Man walking down long passageway casting an extremely prominant shadow
2nd card	Man and crowd fleeing from a group of burning buildings
3rd card	Man carrying woman at the top of stairs
4th card	Man and woman standing near a tree. Figure of another man is in the background
5th card	(TAT card 6BM) Adolescent boy looking out of picture. Includes operation scene
6th card	(TAT card 12M) A young man is lying on a couch with an elderly man looking over him.
7th card	(TAT card 14) Silhouette of a man or woman against a bright window.
8th card	(TAT card 18BM) A man being clutched from behind by three hands
9th card	(TAT card 15) A gaunt man standing among a series of gravestones.
10th card	(TAT card 13MF) A young man standing downcast near the figure of a woman lying in bed.



SAMPLE: DRAW TWO MEN AND A WOMAN TEST

APPENDIX B

B - 1. Rationale of the Guided Clinical Interview

B - 2. Scoring Manual for the Guided Clinical Interviews

B - 3. Scoring Sheet for Clinical Interviews

Research Division
College of Engineering
New York University

RATIONALE OF THE GUIDED CLINICAL INTERVIEW

1

1. Purposes and Functions of the Interview:

The primary purpose of the guided clinical interview is to collect data about the subject which are not available from any other sources. A secondary purpose is to collect information which can be used to validate data already collected or to round out information about the subject which will give us a clearer picture of him.

The interview must be a constructive experience for the subject. If the interview is conducted in such a way that it invites spontaneity on the part of the subject, it should result in a better perspective and orientation for him.

2. The Interviewer as Participant-Observer:

The principal role of the interviewer is that of participant-observer. Here the capacity of the interviewer to listen is essential. The listening should be appreciative, and if it is, rapport is certain to be better than otherwise.

3. Studying the Subject's Attitudes:

In the clinical interview, we are principally interested in eliciting the subject's basic attitudes -- toward himself, toward the present and the future, toward other persons, etc.. The factual information we seek may be exceptionally subtle, and it is best gotten at through an expression by the subject of his attitudes. The personal interaction between us and the subject is therefore especially vital.

Since we are using the guided clinical interview for research purposes essentially, we may set down its characteristics as follows:

1. All subjects interviewed are known to have been involved in a <u>particular concrete situation</u> -- in this instance, one which has led to the need for a leg amputation of some kind.

2. On the basis of the biographical information blank in particular, and the other testing instruments, we have made an analysis of the hypothetically significant elements, patterns, and the total structure of the situation as they have affected the subject. Through this <u>content analysis</u> of the information we have about the subject, we have arrived at some preliminary set of hypotheses concerning the meaning of the experience and the individual's reactions to it and his disability.

3. On the basis of this preliminary analysis, the interviewer has developed a brief interview guide, which sets forth the major areas of inquiry and the hypotheses which guide the kind of material we need to collect in the interview situation.

4. Insofar as possible, the interview itself is focused on the subjective experiences of the subject which may have resulted in the development of his present attitudes.

With such data, it should then be possible for the interviewer to:

(a) test the validity of hypotheses derived from content analysis and psychological theory, and

(b) establish fresh hypotheses about the personality of the subject.

We must come to early agreement that a successful clinical interview is not the automatic product of conforming to a fixed routine of mechanically applicable techniques. In searching for "significant data", we must develop a capacity for continuously evaluating the interview as it is in process.

The following are provisional criteria of the interview process which we can apply during the interview itself to ascertain whether it is likely to be productive for our purposes:

1. Nondirection: In the interview, guidance and direction by the interviewer should be at a minimum.

2. Specificity: The subject's definition of the situation and its meaning to him should find full and specific expression.

3. Range: The interview should maximize the range of evocative stimuli and responses reported by the subject.

4. Depth and personal context: The interview should develop and bring out the affective and value-laden implications of the subject's responses, to determine to what extent the particular experience had central or peripheral significance to him. It should elicit all relevant personal contexts, his idiosyncratic associations, beliefs, and ideas -- in short, the total meaning of his present disability.

Let us now turn to a brief discussion of each of these criteria since it is my judgment that to the extent to which we meet them, we are likely to have interviews which are productive for our purposes.

1. The Criterion of Nondirection:

Because of our orientation in projective psychology, little need really be said about this criterion. We must be prepared to keep the "structure" of the interview at a minimum consistent with the accomplishment of our task. Insofar as possible, we must avoid direct questions even though they are not "leading" in character.

If we really meet this criterion adequately, we can look forward to specificity, range, and depth of response material. Nondirection requires the development and use of unstructured questions which do not fix attention on any specific aspect of the stimulus situation or on the response.

2. The Criterion of Specificity:

We are interested in each subject's perceptual approach to reality and life, but for our purposes we need to know what specific personality factors seem to be operating at the time of the interview. What are the subject's major personality trends and traits, and how are they apparently related to specific experiences associated with the loss of his leg? Here we must try to disentangle cause and effect, to the extent to which this may prove possible.

3. The Criterion of Range:

This refers to the coverage of pertinent data during the interview. As a rough measure of range of our interview, we may apply the following criteria:

Does our interview

(a) Confirm or refute personality hypotheses and responses anticipated from the content analysis?

(b) Suggest interpretations of our personality data?

(c) Indicate that ample opportunities have been provided for the report of unanticipated data?

4. The Criterion of Depth:

Here we must seek a maximum of self-revelatory comments concerning the subject's significant experiences in connection with the amputation and subsequent operations. Such comments may be thought of as varying along a continuum from the conscious to the fore-conscious and perhaps the unconscious.

Our job is to diagnose the level of depth on which the subject is operating at any given moment in the interview and to attempt to shift the "depth level" toward whichever end of the continuum is most appropriate for the material being considered. From a technical and procedural point of view, although each interviewer must depend largely upon his own training and experience, my suggestion is that this shift in depth toward the unconscious end of the continuum can best be achieved by means of follow-up questions, carefully phrased so that there is a minimum of "structure", which refer explicitly to a feeling context. I am suggesting that the approach to "deeper material" is likely to be through the sentiments of the subject.

11.

In the interpretation of the clinical interview data, we have to be prepared to abandon the spurious choice between qualitative and quantitative data. We must be prepared for working out a combination of both types of data which will best serve the interests of our research program. From an interpretative point of view, the guided clinical interview which I have outlined should serve as a fruitful source of hypotheses about the personality characteristics of our subjects. These hypotheses are to be subjected to the test that they are either congruent or incongruent with other data which have been collected on each subject or, contrariwise; the clinical interview data may serve to interpret other data which have been collected by more formal procedures.

It is suggested that the data from the guided clinical interviews be evaluated in terms of the following categories:

1. Intellectual resources
2. Emotional tendencies and temperament
3. V olitional and action tendencies, interests, and strivings
4. Standards
5. A ttitude toward one's body (body image) and to the instinctive desires
6. Attitude toward material needs
7. Attitude toward oneself and ability to deal with oneself
8. Social needs and adjustment to the group
9. A ssets and handicaps -- personality synthesis

Although there is necessarily much overlapping in these categories, some formal statement of the contents of each category is possible and desirable.

1. Intellectual Resources:

The resources for new acquirements and the adaptability of the subject to new problems and conditions are studied and evaluated. One should distinguish between mere knowledge and the individual's ability to utilize it. What is his ability to record and retain? Is there retention of objects or of personal experiences? How much clearness of memory is there? How much vividness? Is imagination rich, dealing more or less with reality by means of pictorial or verbal symbols, or is it filled with phantasies?

2. Emotional Tendencies and Temperament:

Is the basic mood cheerful or gloomy even and with little variation or with marked fluctuations? Are the changes in mood reactive? Is he easily aroused emotionally or is he stolid? Does he react with irritability, annoyance, anger, anxiety, discouragement and fear?

Is the temperament characterised by slow or quick action, restlessness or indolent behavior? With respect to his emotional attitude toward the future, is it optimistic or pessimistic? Is there ease in the display of emotions? Is there much self-restraint? What is the type of humor? Is it good natured or inclined to be sarcastic and at the expense of others?

3. Volitional and Action Tendencies, Interests, and Strivings:

What is the general behavior of the subject while you are talking to him? Is he active or quiet? If active, does he react easily with fatigue? Is he neglectful of his needs for rest? Is he fast and accurate in his actions or more hasty and inaccurate and perhaps impulsive? Is he active in making decisions and in dealing with obstances, that is, does he decide and act quickly, with energy, forcing his will? Or is he passive, reacting with hidden or open resistance to interference? Is he stubborn and unwilling to bend -- with active stubborness?

Is he vacillating and easily influenced in his decisions, showing a lack of resistance and giving into difficulties? Is he cautious, even procrastinating, in making decisions? In action, is he orderly to the extent of being pedantic, or is he careless? Is he to the point or circumstantial in reaching the essentials of a problem?

4. Standards:

What are the ideals and "higher" needs of the subject? What are his ethical goals? Is he tolerant or intolerant toward himself and others? Is he conscientious, with a high sense of duty? What is his peculiar concept of duty? Is it a personal or social conscience? Is he labile in his ethical ideals, or more stable, living up to his ideals with energy? Does he have a tendency to overevaluate? Is this a tendency to hobbies or fanaticism? Is he an extremist? Does he desire to stick to the old (conservatism) or to seek something new? What are his needs for order and regulation? Is he enthusiastic and idealistic or more sober?

How much self-deceit is there? Is it rationalized? How? Is there a tendency to exaggeration, dramatization, or hypocrisy? Is there a tendency toward envy and an inability to be staisfied with what he has? Is he saving or wasteful? What are his attitudes toward religion, mysticism, philosophy?

5. Attitude Toward One's Body and to the Instinctive Desires:

Is there special interest in his body, or is there relative neglect? Can you estimate the strengths of his instinctive desires? A re there any idiosyncrasies? Are there any special cravings? If so, in what are-? How much individual passion is there and what are the resources for restraint? What is the subject's tension curve? What is his reaction to pain? Is he lacking in sensitivity relatively, or hypersensitive, with unwillingness to display his emotions? What are his specific attitudes toward illness and his specific disability?

6. Attitude Toward Material Needs:

Does he have a great need for considerable material wealth for the sake of security or to satisfy other cravings? Is any need for acquisition of wealth based on a desire for power? What are his ambitions for power, social standing, etc.?

7. Attitude to Oneself and Ability to Deal with Oneself:

What is his attitude toward himself -- self-analytical, with a self-critical or self-contented twist? What is his level of aspiration? Is he willing to face himself, or does he shrink from this task? What is his capacity for self-denial? How much frustration tolerance does he appear to have? How much direct and immediate gratification of his wishes may be necessary?

Does he have confidence in himself? Is it only superficial or is it "deep"? Does he accept responsibility or shrink from it? To what extent can he be pushed? What are his needs for recreation? What is his sense of honor and what are his needs for self-respect? What are his needs for attention, for social approbation, etc.? Does he have a need for originality, for creativeness? What is the level of his spontaneity?

8. Social Needs and Adjustment to the Group:

Does he feel a sense of loneliness? Does he really belong to any groups? What ones? Is he socially dependent or self-sufficient? Is he concerned with the impression he makes on others so that he feels ill at ease and self-conscious? Does he clearly show aggressiveness and arrogant, domineering behavior? Is he frank and does he show a need to confide in others? In whom is he inclined to confide? What seem to be his family attitudes? How great is his need for social contact? Is he exclusive in his friendships? How much sympathy and thoughtfulness are there? What are his needs to receive and give affection? Is he active or submissive?

9. Personality Synthesis:

What valid hypotheses about the subject's personality are we able to make?

April 5, 1947

SCORING MANUAL FOR GUIDED CLINICAL INTERVIEWS

A. INTRODUCTION

Because of the fact that the focus of our research is on group trends rather than on the single case, the standardization of a procedure for the evaluation of clinical interview data is very important. Such a procedure, which is standardized, takes on added significance in a situation which calls for several different psychologists to evaluate the same clinical interview data.

This Manual sets forth what is believed to be a practicable and workable procedure for the evaluation of clinical interview data by means of a limited number of evaluation categories which, in theory, are regarded as significant. Although it may never actually become possible in the evaluation of such interview data to reduce the nuances of a subject's attitudes to categories which can be fully and readily agreed upon, I am of the opinion that some worthwhile steps can be taken in this direction. As may be observed, the method proposed here is really a compromise between individual clinical studies and quantification.

It is well known that a number of possible techniques for the analysis of qualitative data and their expression in quantitative terms have been proposed, among which are the sentiments analysis proposed by Murray and the value analysis advocated by White. A careful consideration of each of the several useful techniques which are available for the evaluation of clinical and projective data has convinced me, however, that their mechanics is too complicated and cumbersome for our present purposes, and that we must content ourselves with a less ambitious, and more feasible, procedure.

It may be readily recognized that a number of the categories herein proposed have been largely inspired by psychoanalytical thinking, taken in the widest sense. Such an approach, in principle, seeks to establish two classes of hypotheses -- dynamic and genetic propositions -- of ; generality. My attempt to use such conceptions rests upon the belief that a large number of our guided clinical interviews should be sufficiently rich in data to permit such an evaluation. In point of fact, I recognize that this situation is true only within limits, and we must therefore be prepared to adjust the level of our analysis of any particular clinical interview to the richness or poorness of the data which are actually available.

My impression is that the majority of our interviews are pretty well saturated with purely factual data which can, however, be utilized in our evaluation. In addition, I am of the opinion that many of the interviews contain expressions of attitudes, sentiments, feelings, and the like, all of which should be very useful for our purposes. We must try to be as skillful as possible in extracting the less obvious from the more obvious.

B. THE SCORING CATEGORIES

The main categories in terms of which the clinical interview data are to be scored are:

1.0 Attitudes Toward the Family

2.0 Attitudes Toward People in General

3.0 Attitudes Toward Sex

4.0 Attitudes Toward Self

5.0 Attitudes Toward Injury

6.0 Value-Orientations

A tentative schedule of categories and sub-categories follows:

1.0 ATTITUDES TOWARD FAMILY

1.11 Objective appraisal of parents -- conventional idealization: overestimation of qualities and status

1.12 Objective appraisal of parents -- underestimation

1.13 Fairly treated by parents -- victimization by parents: feelings of resentment and hostility toward parental figures, expressed in such terms as neglect, unjust discipline, etc.

1.14 Genuine positive affect for parents, by reference to favorable characteristics of parents -- genuine negative affect toward parents, by reference to unfavorable personal characteristics of parents

1.15 Independence of parents for material things -- dependence on parents for material things

1.16 Non-submission to parental authorities and values -- submission to parental authorities and values, based on fear or dependency

1.17 Warm, demonstrative father -- stern, distant father

1.18 Warm, demonstrative, affectionate mother -- cold, distant mother

1.20 ATTITUDES TOWARD SIBLINGS

1.21 Acceptance -- rejection

1.22 Genuine rivalry toward siblings -- little evident rivalry toward siblings

1.23 Status determined by siblings -- status not apparently determined by siblings

1.30 ATTITUDES TOWARD CHILDHOOD

1.31 Discipline which can be assimilated -- discipline threatening, traumatic, overwhelming

1.32 Discipline for violation of principles, rationally explained -- discipline for violation of rules, primarily moralistic

1.33 Happy childhood -- unhappy childhood

1.34 Conforming behavior -- unconforming behavior

2.0 ATTITUDES TOWARD PEOPLE IN GENERAL

2.1 Close -- distant (relationships)

2.2 Many -- few

2.3 Equal -- inferior

2.4 Equal -- superior

2.5 Approval -- disapproval

2.6 People essentially good until proved otherwise -- distrust and suspicion

2.7 Relates easily to others -- relates to others with difficulty

2.8 Fairly treated by others -- victimized by others

2.9 Independent of others -- dependent on others

3.0 ATTITUDES TOWARD SEX

3.1 Acceptance and participation vs over rationalization and over compensation

3.2 Acceptance vs inadequacy

3.3 Strong masculine identification and strivings -- weak masculine identification and strivings

3.4 Fusion of sex and affection, personalized sex orientation -- sex versus affection, depersonalized sex relations or interests

3.5 Genuine respect - fondness for opposite sex -- underlying disrespect resentment toward opposite sex

3.6 Love-seeking (warmth and affection) attitude -- power - orientation, exploitative-manipulative attitude based on concrete benefits

4.0 ATTITUDES TOWARD SELF

4.1 Objective self-appraisal -- self-glorification (positive traits mentioned and negative traits rationalized)

4.2 Self-acceptance -- self-rejection (self-contempt)

4.3 Social-psychological explanation of self -- denial of genuine dynamics (explanation of self in terms of such factors as heredity, physical status, injury, etc.)

4.4 Conventional moralism: honesty, high ideals, self-control -- fallibility of self-control

4.5 Regards himself as the same as other persons -- different from other persons

4.6 Continuity between childhood-self and present-self -- discontinuity

5.0 ATTITUDES TOWARD INJURY

5.1 Acceptance of injury-non-acceptance of injury

5.2 Ego status intact in spite of injury -- ego status impaired because of injury

5.3 Resentment toward no one by reason of injury -- resentment toward others because of injury

5.4 Level of aspiration consistant with injury -- level of aspiration not consistant with injury

5.5 Does not "trade on" injury -- tends to "trade on" injury

5.6 Injury less serious than might have been the case -- injury over-whelmingly more serious than other war-connected injuries

6.0 VALUE ORIENTATION

6.1 Independence -- dependence

6.2 Strong achievement -- weak achievement

6.3 Dominance -- submission

6.4 Strong social recognition -- weak social recognition

6.5 Good intelligence -- poor intelligence

6.6 Good appearance -- poor appearance

6.7 Strong self-regard -- weak self-regard

6.8 Flexibility -- rigidity

C. PROCEDURE FOR SCORING

Because of the structure of our interviews, I propose that we do not analyze them in piece-meal fashion, since this is not likely to be practicable within the limits of our time, nor may it be fully justified on other grounds. Rather, I think we should strive for a synoptic type of analysis in which we utilize evidence for each scoring category wherever it is found in the interview. This is not likely to prove easy because of the fact that the vast majority of the interviews have not as yet been transcribed, and one cannot readily go back over the interviews seeking material to use for the several categories.

The ratings for each category should be made on a five point scale -- 2, 1, 0, -1, -2 -- Plus, Neutral, or Minus, designated as +, 0, and -.

The Plus score does not mean a commitment on our part to some value orientation, and indicates simply that the evaluator finds evidence in the clinical interview data which supports clearly the scoring of the

first polar alternative proposed for the category.

The Minus score is intended to indicate that the clinical interview data clearly support the opposite polar alternative of the category.

The Neutral score involves basically two possibilities: (1) that the existing evidence from the interview is too colorless or too self-contradictory to support the scoring of either of the two polar alternatives, or (2) that there is no evidence at all in the whole interview which may be regarded as pertinent ot the category in question. One suspects that purely factual categories are more likely to yield "No evidence" -- and thus be scored Neutral -- than the interpretative categories for which the evaluator can use a broader basis of inference.

In any event, in the interpretation of the interview and in the reduction of the clinical data to some or all of the categories proposed in this Manual for the purpose of quantification, the clinical psychologist must rely heavily, and necessarily, upon a body of skills and knowledge variously referred to as "clinical judgment" or "clinical insight". I see no way of circumventing this situation even if one were justified in trying to do so. I am persuaded that if something approximating the following procedure is adhered to, reasonable quantification is possible:

1. Listen to the interview as a whole, writing down hypotheses about the personality.

2. Relisten serially to portions of the interview as it unfolds, seeking evidence to support or refute previously developed hypotheses and to develop new hypotheses.

3. Review the entire structure of hypotheses formulated, using a wider and wider basis for inference with respect to each hypothesis, if possible.

4. On the basis of the limited number of hypotheses which emerge, fill in the Check Sheet provided, returning, if necessary, to the actual interview, for needed evidence for inferences.

Clinical Rating of.....

	+	0	-
1.0 Attitudes Toward Family			
1.10 Attitudes Toward Parents			
1.11 Objective appraisal of parents -- conventional idealization: overestimation of qualities and status.			
1.12 Objective appraisal of parents -- underestimation			
1.13 Fairly treated by parents -- victimization by parents: feelings of resentment and hostility toward parental figures, expressed in such terms as neglect, unjust discipline, etc.			
1.14 Genuine postivie affect for parents, by reference to favorable characteristics of parents -- genuine negative affect toward parents, by reference to unfavorable personal characteristics of parents.			
1.15 Independence of parents for material things -- dependence on parents for material things.			
1.16 Non-submission to parental authorities and values -- submission to parental authorities and values, based on fear or dependency.			
1.17 Warm, demonstrative father -- stern, distant father			
1.18 Warm, demonstrative, affectionate mother -- cold distant mother.			
1.20 Attitudes Toward Siblings			
1.21 Acceptance -- rejection			

		+	0	-
1.22	Genuine rivalry toward siblings -- little evident rivalry toward siblings.			
1.23	Status determined by siblings -- status not apparently determined by siblings.			
1.30	Attitudes Toward Childhood			
1.31	Discipline which can be assimilated -- discipline threatening, traumatic, overwhelming.			
1.32	Discipline for violation of principles, rationally explained -- discipline for violation of rules, primarily moralistic.			
1.33	Happy childhood -- unhappy childhood.			
1.34	Conforming behavior -- unconforming behavior.			
2.0	Attitudes Toward People in General			
2.1	Close -- distant (relationships).			
2.2	Many -- few.			
2.3	Equal -- inferior			
2.4	Equal -- superior			
2.5	Approval -- disapproval			

	+	0	-
2.6 People essentially good until proved otherwise -- distrust and suspicion.			
2.7 Relates easily to others -- relates to others with difficulty.			
2.8 Fairly treated by others -- victimized by others.			
2.9 Independent of others -- dependent on others			
3.0 Attitude Toward Sex			
3.1 Acceptance and participation -- over rationalization and over compensation.			
3.2 Acceptance -- inadequacy.			
3.3 Strong masculine identification and strivings -- weak masculine identification and strivings.			
3.4 Fusion of sex and affection, personalized sex orientation -- sex versus affection, depersonalized sex relations or interests.			
3.5 Genuine respect - fondness for opposite sex -- underlying disrespect resentment toward opposite sex.			
3.6 Love - seeking (warmth and affection) -- power - orientation, exploitative-manipulative attitude based on concrete benefits.			

		+	0	-
4.0	Attitudes Toward Self			
4.1	Objective self-appraisal -- self-glorifaction (positive traits mentioned and negative traits rationalized).			
4.2	Self-acceptance -- self-rejection (self-contempt).			
4.3	Social-psychological explanation of self -- denial of genuine dynamics (explanation of self in terms of such factors as heredity, physical status, injury, etc)			
4.4	Conventional moralism: honesty, high ideals, self-control -- fallibility of self-control.			
4.5	Regards himself as the same as other persons -- different from other persons.			
4.6	Continuity between childhood-self and present-self -- discontinuity between childhood-self and present-self.			
5.0	Attitudes Toward Injury			
5.1	Acceptance of injury -- non-acceptance of injury.			
5.2	Ego status intact in spite of injury -- ego status impaired because of injury.			
5.3	Resentment toward no one by reason of injury -- resentment toward others because of injury.			

	+	0	-
5.4 Level of aspiration consistant with injury -- level of aspiration not consistant with injury.			
5.5 Does not "trade on" injury -- tends to "trade on" injury.			
5.6 Injury less serious than might have been the case -- injury over-whelmingly more serious than other war-connected injuries.			
6.0 Value Orientation			
6.1 Independence -- dependence.			
6.2 Strong achievement -- weak achievement.			
6.3 Dominance -- submission.			
6.4 Strong social recognition -- weak social recognition.			
6.5 Good intelligence -- poor intelligence.			
6.6 Good appearance -- poor appearance.			
6.7 Strong self-regard -- weak self-regard.			
6.8 Flexibility -- rigidity.			

APPENDIX C

C - 1. Instructions for Neurological Examination and Sensory Exploratory Studies

NEUROLOGICAL EXAMINATION

1. CRANIAL NERVES
2. MOTOR FUNCTIONS
    - A. Gait, Station and Attitude
    - B. Muscle power, tone, volume and reactions
    - C. Coordiantion
        - (a) Successive movements and skilled acts
        - (b) Finger to Nose and Heel to Knee Tests
    - D. Involuntary Movements
3. REFLEXES
    - A. Deep
    - B. Superficial
    - C. Pathological
    - D. Meningeal
4. SENSORY STATUS
    - A. Touch
    - B. Pain
    - C. Temperature
    - D. Sense of Position
    - E. Vibration Sense
    - F. Sterognosis
5. SPEECH (AND APHASIC STATUS)

AMPUTEE EXAMINATION

I

ROUTINE NEUROLOGICAL - plus

Finger to nose test	All these tests to be done with and without prosthesis, and if amytal interview included, before and under amytal.
Finger to finger test	
Grip strength (dynamometer, 3 left, 3 right	
L. B. V. (arm level finding)	
a) right arm raised	
b) left arm raised	
Heel to knee test (right, left)	
Imitation phenomenon	
Barognosis (weight lifting)	
Tomus glasses (evaluate effect by means of dynamometer readings)	

II

SPECIAL SENSORY EXAMINATIONS

ON STUMP

Light touch (cotton wisp drawn into 1 or 2 fine strands)

Pin Prick

Temperature (cold 10°, and warm 40° - glass tube with chemical thermometer)

Roughness (flint papers)

Direction of lines	Always compare chosen area on stump with homologous area on sound leg.
Point localization	
Two-point discrimination (20 determinations at each separation of compass)	

Graphesthesia (follow standard San Diego series)

TINEL'S SIGN

Tapping in various areas on stump - especially over scars to determine if tingling is elicited.

If tingling is present, determine:

A. if it spreads into phantom

B. if the spreading is over a continuous or discontinuous path (indicated by patient drawing path into diagram)

C. direction paresthesis spreads (toe, hallux, distally, etc.)

In cases of painful stump and/or phantom limb, examine for any "trigger-zones" for eliciting tingling or pain, and if such trigger-areas are homolateral to stump or contralateral to stump.

EXAMINE FOR CAUSALGIA-LIKE SYMPTOMS

Exacerbation of stump and/or phantom limb

A. on mere suggestion of touch

B. in response to noises (screeching sounds, scraping of 2 pieces of sand paper against eachother)

EXAMINE FOR ANY EVIDENCE OF DISTURBANCE IN VASOMOTOR FUNCTION IN STUMP

A. redness or cyanosis

B. abnormal warmth or coldness of skin over stump (as compared with homologous area on sound leg) (use of Dermotherm)

EXAMINE FOR ANY EVIDENCE OF LOCAL AUTONOMODYSFUNCTION

Determine by mapping skin resistance in stump and in homologous area of sound limb with the use of Richter's Neuro-dermometer

III

SPECIAL EXPLORATION OF PHANTOM LIMB PHENOMENON

Have patient "move" phantom with and without prosthesis

A. Flex and extend big toe
B. Move other toes separately
C. "Fanning of all toes
D. Rotate foot in ankle joint - adduct and abduct foot
E. Flexion and extension in knee joint

' Have patient tell you which motions are possible and watch constantly for (1) muscle play in stump and (2) synkinesias in sound limb

Have patient move sound limb in various ways (as above, A-E, for phantom) and inquire about possible experience of synkinetic movements in phantom.

Have patient move phantom (without prosthesis) against solid obstruction and have him report what he feels.

Have patient move phantom (without prosthesis) up and down 10 times and have him tell you whether phantom sensation becomes more marked - less marked (or obliterated) during motion of stump.

INVESTIGATE EFFECTS ON PHANTOM WITH THE FOLLOWING:

A. Ethyl Chloride in local anesthesia in stump
B. Heat Cradle in heating of stump
C. Ice water in cooling of stump
D. Cholinergic drugs (e.g. Neostigmaine)
E. Histamine for any exacerbation of phantom sensation - especially important in cases where phantom was originally quite painful and now almost gone
F. Faradic stimulation
G. Vestibular stimulation (caloric and/or rotatory)
H. Na amytal
I Hypnosis

APPENDIX D

D - 1. Vocational Rating Report

D - 2. Achievement Test Blank

D - 3. Instructions for Completing Achievement Tests

D - 4. Check Sheet "A" for Evaluation of Walking

D - 5. Instructions for Completing Check Sheet "A"

D - 6. Thematic Apperception Test Scoring Sheets

Research Division
College of Engineering
New York University
New York 53, New York

VOCATIONAL RATING REPORT

WORKER'S NAME_____ DATE_____

NAME OF RATER_____ TITLE_____

WHAT IS WORKER'S JOB IN YOUR ORGANIZATION?_____

HOW LONG HAVE YOU KNOWN THE MAN RATED?_____

INSTRUCTIONS

1. Read the entire form through before making any ratings.
2. Before arriving at a judgement about a factor or trait, read carefully the description of the trait or factor and the phrases characterizing the amount of the factor or trait which may be present.
3. Indicate the individual's standing by placing a check at some point on the line extending from one extreme of the trait or factor to the other. You may place your check at any point on the line. It is not necessary to locate it directly above any of the descriptive phrases.
4. Make each judgement as objective and impartial as you can.

1. EMOTIONAL STABILITY: How well poised is he emotionally? Is he touchy, sensitive to criticism, easily upset? Is he irritated or impatient when things go wrong? Or does he keep an even keel?

Over-sensitive Easily disconcerted	Occasionally impatient or irritated	Well poised most of the time	Satisfactory self-command	Shows exceptional poise, calmness and good humor under stress

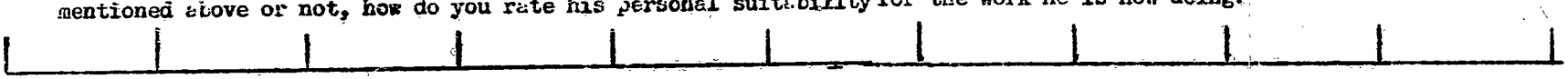
2. SELF-CONFIDENCE: Does he seem to be uncertain of himself, hesitant, lacking in assurance, easily bluffed? Or is he wholesomely self-confident and assured?

Shows superior self-assurance	Wholesomely self-confident	Moderately confident of himself	Appears to be over-self-conscious	Timid, Hesitant, Easily influenced.

3. FRIENDLINESS: Is he a likable person? Are his fellow-workers and subordinates drawn to him or kept at a distance? Does he command personal loyalty and devotion?

An inspirer of personal devotion and loyalty	Draws many friends to him	Approachable, Likeable	Does not easily attract friends	Keeps people at a distance

4. PERSONAL FITNESS FOR THE POSITION: In the light of all the evidence regarding this person's characteristics, whether mentioned above or not, how do you rate his personal suitability for the work he is now doing?



Unsuited for this work Would not recommend	Might do well Recommend with hesitance.	Consider him as average	Recommend with confidence	Recommend with enthusiasm

5. QUALITY OF WORK: Does this man meet your standards for quality of work? Does he represent company policy effectively?

Consistently does excellent job | Significantly above average quality | Work of good quality, few errors | Work of uneven quality, frequent errors | Extremely careless, makes many mistakes

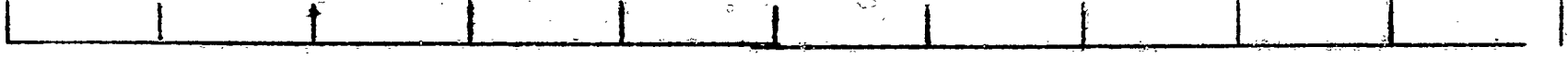
6. QUANTITY OF WORK: Does this man cover his assignments? Is his activity equal to coverage of the fields for which he is responsible?

Does not meet minimum requirements | Frequently does not meet requirements | Does what is expected of him | Very industrious, handles assignments well | Superior work record

7. COMPARISON WITH MEN WITH SAME LENGTH OF SERVICE: Is this man one of the best, just average, or definitely below average compared with men with the same length of time?

Definitely below average | A little backward but coming along | Average prospect | Definitely above average | A real find, among our best

8. EVIDENCE OF GROWTH: Has this man demonstrated that he can profit from experience? Has he developed in skill and proficiency? Has he continued to acquire knowledge?



Unusual growth | Very good progress | Average improvement | Growth spotty uneven | Has not developed at all

9. POSSIBILITY FOR FUTURE GROWTH: Has this man about reached his level? Is he still growing? Does he try to improve himself? Is he ambitious to get ahead?

Very limited capacity for growth	May develop. Lacks ambition	Fair possibilities	Better than average	Will grow indefinitely

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CHECKING IN THE APPROPRIATE PLACE

1. How does he get along with other employees?

   Well_____ Average_____ Poorly_____

2. How often is he absent from work?

   Seldom_____ Occasionally_____ Frequently_____

3. Does he use his amputation as an excuse to avoid work?

   Yes_____ No_____

4. What do you regard as his prospects for advancement?

   Good_____ Average_____ Poor_____

SCORING OF ACHIEVEMENT TESTS

Name _____ C # _____ Date _____

No. and Name of Test	Grade	Remarks
1. Sitting		
2. Rising from Floor		
3. Balance on Prosthesis	Time in Sec.	
4. Walking on Board (a)		
(b)		
5. Change Stepping		
6. Stepping over Obstacle (a)		
(b) 1) 12"		
18"		
24"		
(b) 2) 12"		
18"		
24"		
7. Descending (a)		
(b)		
(c)		
8. Fifteen Yard Run	Time in Sec.	
9. Pick up Article from Floor		

ACHIEVEMENT TESTS

All pilot wearers attempt to perform the following tasks in the manner as indicated:

1. SITTING - from standing to sitting to standing, without use of hands.

2. RISING FROM FLOOR - from standing to sitting or prone position on floor to standing, any technique.

3. BALANCE ON PROSTHESIS - natural limb away from prosthesis; time by stop watch; score best out of 3 trials.

4. WALKING ON BOARD - board to be the width of a normal foot and long enough for at least 8 steps.

   a) Forward
   b) Backward

5. CHANGE STEPPING - change in stride; skip type walk.

6. STEPPING OVER OBSTACLE - board 12" high, 3" wide.

7. DESCENDING STAIRS - without use of hand rail.

   a) for those who attempt this
   b) for those who use ramp steps but not railing
   c) for those who refuse to descend without aid of railing

8. FIFTEEN YARD "RUN" - time by stop watch; score on time needed to cover 15 yards.

9. PICK UP ARTICLE FROM FLOOR - article to be small and light; any technique.

METHOD OF SCORING

All subjects are graded on their performance of each of the tasks. The method of scoring is as follows:

   a) 3-smooth, no strain
   b) 2-somewhat labored or showing evidence of strain, somewhat clumsy
   c) 1-accomplished with much strain or with marked tremors, quite clumsy and awkward
   d) 0-cannot accomplish task

Plus (+) or minus (-) signs may be used when necessary to indicate more accurate scoring.

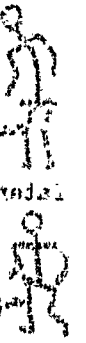
If subject accomplishes task in an unorthodox manner, remarks are noted.

CHECK SHEET "A" FOR EVALUATION OF WALKING
FROM THE STANDPOINT OF APPEARANCE

NAME_____ TYPE OF LEG_____

DATE OF EVALUATION ON INDOOR TRACK_____ OF MOTION PICTURE_____

	Poor	Fair	Good
I Sidesway of hips			
II Lateral bending of trunk			
III Lateral dipping of pelvis			
IV Excessive raising of normal heel			
V Pelvic rotation about vertical axis			
VI Arm swing, normal side			
VII Arm swing, prosthetic side			
VIII Length of prosthetic "step"			
IX Timing of heel contact			
X Lumbar curvature			



Total score_____ Weighted Score_____

Name of evaluator_____

INSTRUCTIONS FOR COMPLETING CHECK SHEET "A":

Grades used are poor (1), fair (2), and good (3). If desirable, a plus (+) may be used after "poor" and "fair". Do not use a minus sign.

Poor (1) - deviation from normal pattern is very marked

Fair (2) - definite deviation from normal, but less conspicuous than previous

Good (3) - minimum amount of deviation from normal

Items checked:

I - Sidesway of hips - observing the path which the entire pelvis travels to the right and to the left in relation to a line representing the walking direction.

Projection on horizontal plane. Viewed from above. Note that sidesway can also be observed as the subject walks away from or toward the observer.

II - Lateral bending of trunk. Deviation of trunk line * toward side of prosthesis when prosthesis is stance leg. Subject is walking away from or toward the observer. Projection on frontal plane.

III - Lateral dipping of pelvis. Lowering of the side of the pelvis opposite to the prosthetic side when weight is transferred to prosthetic leg.

IV - Excessive raising of normal heel. Observe if body as a whole is raised and lowered markedly on each step. The raising occurs when the normal leg is stance leg and the prosthesis swings through.

* A line connecting midpoint of shoulder line with midpoint of hip line.

V - Pelvic rotation about a vertical axis. Observe if there is an undue rotation forward of the pelvis on the side of the prosthesis when prosthesis swings forward.

VI - Arm swing, normal side. Observe if there is an exaggerated swinging of the arm opposite to the prosthetic side.

VII - Arm swing, prosthetic side. Observe if there is decreased swinging of the arm on the side of the prosthesis.

VIII - Length of prosthetic "step" (distance which prosthetic heel advances beyond normal heel). Observe if prosthetic "step" is longer than "step" of normal foot.

IX - Timing of heel contact. Observe if knee extension occurs smoothly and if heel strikes ground without excessive swing.

X - Lumbar curvature. Observe if lumbar curvature increases as weight is transferred to prosthetic leg.

Note: Additional remarks may be made at the bottom of the page. Any peculiarity of gait not listed, such as "side circling" of prosthesis as prosthesis swings through, hyperextension of knee (prosthetic), causing disturbance in rhythm, lateral "whipping" of shin, etc. should be noted, if present. "Whipping" without marked lateral deviation comes under item X.

Picture #_____

QUALITATIVE DATA

1. Main Theme:

2. Main Hero (Heroine): age_____ ;vocation_____ sex_____
   interests_____
   traits_____
   abilities_____
   adequacy_____

3. Attitudes to superior (parental) figures, or to society: (0-3)

   abasive_____ compliant_____ respectful_____ devoted_____
   grateful_____ dependent_____ remorseful_____ competitive_____
   resistant_____ aggressive_____ revengeful_____

4. Figures introduced: punisher_____ pursuer_____ benefactor_____
   friend_____ enemy_____ reformer_____ lover_____ supporter_____

5. Objects introduced: symbols:

6. Objects omitted:

7. Attribution of blame: (0-3) injustice_____ indifference_____
   deception_____ severity_____ deprivation_____ unfortunate influence_____

8. Significant conflicts: (0-3) Super Ego-Id_____ passivity-counteraction_____
   compliance-autonomy_____ adherence-departure_____ achievement-pleasure_____

9. Punishment (for crime): just_____ too severe_____ lenient_____ none_____
   immediate_____ delayed_____

10. Attitude to hero: detached and objective_____
    critical and abusive_____
    involved and emphatic_____

11. Signs of inhibition at aggression, sex, etc.:
    pauses_____ change of trend_____ stammer:_____

12. Outcome: happy_____ unhappy_____ realistic_____ unrealistic_____

13. Conditions of need gratification:
    need-conflict
    need-fusion
    need subsidiation

14. Plot: structured 0 1 2 3 unstructured
    realistic 0 1 2 3 bizarre
    complete 0 1 2 3 incomplete

SUMMARY
(Record main data from each story)

#1. Theme
and:

#2

#3

#4

#5

#6

#7

#8

#9

#10

APPENDIX E

E - 1. Instructions for Scoring Open-End Attitude Scale

PROCEDURE FOR SCORING THE OPEN-END ATTITUDE SCALE

A. Each of the fifty responses is to be scored and evaluated independently of each of the others.

B. Record the scoring of each item in the space provided at the extreme right of each item.

C. Score each item omitted -- and there should be none -- as Zero (0).

D. Score each "C" response as Minus One (-1).

E. Score each "P" response as Plus One (+1).

F. Score each "N" response as Zero (0).

1. "C" or Conflict Responses are those presumptive of or indicating an unhealthful or maladjusted frame of mind.

2. "P" or Positive Responses are those presumptive of or indicating a healthful or hopeful frame of mind or the expression of humor.

3. "N" or Neutral Responses are those not falling clearly into either of the above categories. They are generally on a simple descriptive level, such as, "I often think that my wife is pretty," which evade the purpose of the Scale, and are usually scored as "N" or neutral.

EXAMPLES OF SCORING STANDARDS

Item 2. I often think that.....

"C" -- I cannot sleep nights, stand my job, think straight, concentrate, do much, sit still, express myself, etc., etc.

"P" -- I can (do some specific skill, such as type or spell, etc.)

Item 50. As for the future, I.....

"C" -- find it black, have no future, find it hopeless, it's dark, find it questionable, etc., etc.

"N" -- it has yet to come, it's undecided, etc.

"P" -- find it's better than the past, it's good, I hope; think it's something to plan for; think it's bright, OK, good, etc., etc.